

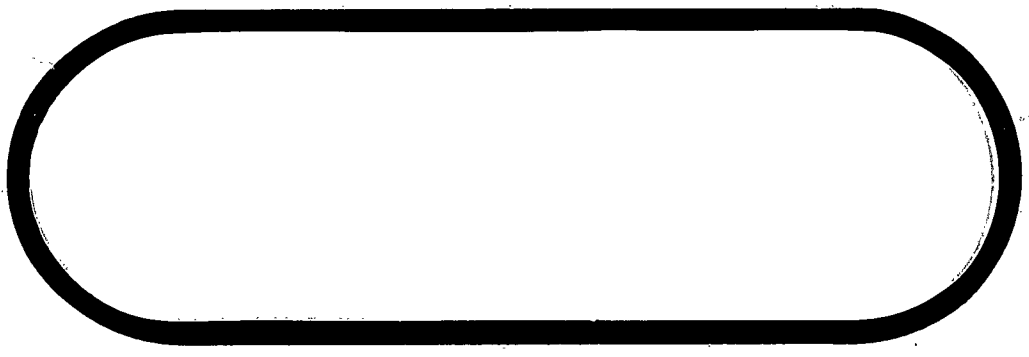
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THE **BOEING** COMPANY

CODE IDENT NO. 81205

NUMBER T2-2786, Vol. II

TITLE Electro-Interference Test Report on Power Supply Group,
(Figure "A" 1284) Serial Number 0004

MODEL NO. W3-133A CONTRACT NO. AF04(647)-289

ISSUE NO. 34 ISSUED TO BDO/TOC

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VOL. NO. 2 of 2 OF T2-2786
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1.0 **REFERENCES**

- 1.1 **Boeing Document D2-11802, Electro-Interference Test Requirements for Power Supply Set, DC, LF, Figure A 1284**
- 1.2 **Boeing Document D2-12233, Functional Test Procedure for Launcher Power Supply Set, Electro-Interference Test Set (A 1284)**
- 1.3 **Boeing Document D2-9801, Electro-Interference Test Plan for Operational WS-133A Equipment**
- 1.4 **Space Technology Laboratories Specification GWO7-59-2617A, Electro-Interference Control Requirements for Minuteman (WS-133A)**

2.0 ADMINISTRATIVE DATA

2.1 Purpose of Test

The purpose of this test was to determine the generated electro-interference levels and susceptibility characteristics of the Test Item, Figure A 1284, Serial No. 0004. The following tests were performed:

Conducted Interference
Radiated Interference
RF Conducted Susceptibility
Magnetic Induced, Equipment Susceptibility
Magnetic Induced, Cable Susceptibility

2.2 Description of Test Item

The Test Item, Power Supply Group, DG, LF, OA-3386/GSW-4, Serial No. 0004, Boeing Part No. 25-22552-36, Figure A 1284, consists of one rack containing four 28 VDC power supplies, an AC Panel, and a DC Panel. The supplies are rated at 12A, 24A and two at 36A. The 24A supply was not included in the Test Item submitted for electro-interference tests.

Facilities required by the Test Item for operation are 120/208 volt, 400 cycle, 3 phase power, and 66 lbs/min. at 55 ± 2 degrees F, cooling air.

The Power Supply Group is located in each WS-133A Launcher as part of the Electric Power Subsystem and performs the following functions:

- a. Converts 400 cycle power to regulated DC.
- b. Distributes both 400 cycle AC power, and regulated DC, to Launcher equipment.
- c. Provides AC and DC circuit protection for the power distributed.
- d. Provides switching functions for DC power distribution.

3.0

SUMMARY

The following electro-interference tests were performed in accordance with the requirements of References 1.1 and 1.3.

Conducted broadband interference: transient and steady-state

Radiated broadband interference: transient and steady-state

Conducted CW interference

Susceptibility: RF Conducted

Susceptibility: Equipment and Cable, Magnetic-Induced

Conducted broadband measurements exceeded the limits of Reference 1.4 in 61% of the readings.

Conducted CW measurements exceeded the limits of Reference 1.4 in 84% of the readings.

Broadband radiated measurements exceeded the limits of Reference 1.4 in 24% of the readings.

Susceptibility test results were as follows:

RF Conducted Susceptibility: Not susceptible

Magnetic Induced, Equipment Susceptibility: Not susceptible

Magnetic Induced, Cable Susceptibility: Not susceptible

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4.0

TEST CONDITIONS

Test conditions complied with the requirements of Reference 1.1 and Reference 1.3, paragraph 5.0

The electro-interference tests were conducted in Shield Room 24 of the 9.101 Building. All ambient levels were within the limits of Reference 1.4.

The Test Item was positioned and connected to the Load Simulator 25-28997, as specified in Reference 1.1, paragraph 1.6.

The Test Item and the Load Simulator were grounded according to Reference 1.1, paragraph 2.6.

Power and forced air cooling were supplied to the Test Item as specified in Reference 1.1, paragraph 1.4.2. Power to the Test Load was supplied as specified by Reference 1.2, paragraphs 3.0 and 4.0.

Prior to testing, the Test Load was functionally checked out according to Reference 1.2.

Power and cooling air were periodically checked during the test for compliance with the specifications of References 1.1 and 1.2.

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5.0 TEST PROCEDURES AND OPERATION

5.1 Procedures

Test procedures followed the requirements of References 1.1 and 1.3. The required tests performed were those called out in Reference 1.1, paragraph 2.4.

Conducted interference tests were made in accordance with Reference 1.3, paragraph 6.0 and Reference 1.1, paragraph 3.2.

Radiated interference tests were made in accordance with Reference 1.3, paragraph 7.0 and Reference 1.1, paragraph 3.3.

Magnetic Induced, Cable Susceptibility tests were made in accordance with Reference 1.3, paragraph 9.9 and Reference 1.1, paragraph 3.4.

Magnetic Induced, Equipment Susceptibility tests were made in accordance with Reference 1.3, paragraph 9.8 and Reference 1.1, paragraph 3.4.

RF Conducted Susceptibility tests were made in accordance with Reference 1.3, paragraph 9.2 and Reference 1.1, paragraph 3.4.

Criteria for determining susceptibility were defined in Reference 1.1, paragraph 3.4.

5.2 Operation

It was established before starting the test, and during the test, that the Test Item and Test Load were operating in a satisfactory functional manner.

Radiated and Conducted broadband tests were performed in each of three modes. Modes 1 and 2 were steady state and Mode 3 was transient. All modes were operated as described in Reference 1.1, paragraph 3.1 and Table 1. Mode 3 consists of alternately depressing the "G&C Coupler Power On" and "G&C Coupler Power Off" switches. It was recorded in the remarks column of the data sheet which operation generated the highest reading. Other abbreviations found in the column are defined in Appendix VI.

In steady state Modes 1 and 2, a scan for the presence of CW signals was made in each frequency range.

All Susceptibility tests were performed in Mode 2.

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6.0 TEST RESULTS

6.1 Conducted Interference

6.1.1 Broadband

About 61% of all broadband conducted levels exceeded the limits of Reference 1.4. Conducted steady-state exceeded these limits at the following test points in Modes 1 and 2.

<u>Test Point</u>	<u>Mode</u>	<u>Over the Limit Frequency Range (MC)</u>	<u>Freq. at Max. Level (MC)</u>	<u>Max. DB</u>
J09-1	1	30 cps - .015		13
J09-1		.026 - 3	.8	38
J09-2		30 cps - .015		13
J09-2		.027 - 3	.6	37
J09-3	2	30 cps - .015		13
J09-3		.022 - 3	.6	37
J09-4		30 cps - .015		1
J09-4		.2 - 1.5	1.0	20
J09-1		30 cps - .015		19
J09-1		.031 - 2.5	.67	41
J09-2		30 cps - .015		21
J09-2		.016, .027 - 2.5	.6	40
J09-3	2	30 cps - .015		25
J09-3		.016, .032 - 2.5	.5	38
J09-4		30 cps - .015		10
J09-4		.2 - 2.5	1.2	22
TP-1		.6 - 2		14
TP-2	2	.8 - 2.5	1.2	8

Conducted transient readings exceeded the limits at the following test points in Mode 3.

<u>Test Point</u>	<u>Mode</u>	<u>Over the Limit Frequency Range (MC)</u>	<u>Freq. at Max. Level (MC)</u>	<u>Max. DB</u>
J09-1	3	30 cps - .015		24
J09-1		.015, .020, .03 - 25	2.5	65
J09-2		30 cps - .015		25
J09-2		.015, .030 - 25	2.5	72
J09-3		30 cps - .015		25
J09-3		.015, .03 - 25	2.0	62
J09-4		30 cps - .015		14
J09-4		.04 - 25	2.0	59
TP-2		.8 - 25	2.0	38
TP-3		30 cps - .015		6
TP-3	3	.04 - 25	2.0	56
TP-4		.6 - 25	25.0	41
TP-5		.8 - 25	8.0	52

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6.1.2 CW Interference

CW signals were measured in Modes 1 and 2. Most of these signals were in the frequency range of 14 KC to 150 KC and occurred about every 2.2 KC. To limit the number of measurements, readings were restricted to three per frequency octave. About 84% of all CW levels exceeded the limits of Reference 1.4. The following list gives all above limit frequencies in Modes 1 and 2.

Test Point	Mode	Over the Limit Frequency Range (MC)	Freq. at Max. Level (MC)	Max. DB
J09-1	1	.015, .021, .027, .032, .041, .051, .06, .08, .1, .12, .14	0.1	18
J09-2		.015, .022, .027, .032, .041, .051, .062, .08, .1, .12, .14	0.1	17
J09-3		.016, .021, .026, .031, .041, .051, .06, .08, .1, .12, .14		20
J09-4	1	.017, .022, .027, .031, 2.55	2.55	16
J09-1	2	.016, .021, .026, .031, .041, .051, .06, .08, .1, .121, .141, .67, .83, 1, 1.6, 2, 2.5	1	22
J09-2		.016, .021, .027, .032, .041, .051, .06, .084, .101, .12, .14, 1, 1.2, 2, 2.5	1	22
J09-3		.016, .021, .027, .032, .042, .05, .06, .081, .1, .121, .144, 1, 1.2, 2.1	1	23
J09-4		.017, .021, .031, .5, 1.2, 1.9		
TP-2	2	.56	0.017 0.56	14 13

6.2 Radiated Interference

6.2.1 Broadband Radiated

About 24% of all broadband radiated levels exceeded the limits of Reference 1.4. Transient interference exceeded the limits in the following Frequency range for Mode 3.

Frequency Range (MC)	Freq. at Max. Level (MC)	Max. DB
.03, .05, .2 - 200	40	39

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6.2.1 Broadband Radiated (continued)

All broadband, radiated, steady-state interference was below the limits of Reference 1.4.

6.2.2 CW Radiated

No radiated CW signals were detected.

6.3 Susceptibility Tests

6.3.1 RF Conducted

Susceptibility Voltage
Insertion Point

Test Point Monitored

Result

J9-1

J01-17 & J01-20
J01-18 & J01-19
J03-3 & J03-5

Not susceptible
Not susceptible
Not susceptible

J9-2

J01-17 & J01-20
J01-18 & J01-19
J03-3 & J03-5

Not susceptible
Not susceptible
Not susceptible

J9-3

J01-17 & J01-20
J01-18 & J01-19
J03-5 & J03-5

Not susceptible
Not susceptible
Not susceptible

J9-4

J01-17 & J01-20
J01-18 & J01-19
J03-3 & J03-5

Not susceptible
Not susceptible
Not susceptible

6.3.2 Magnetic Induced, Equipment

Test Point Monitored

Result

J01-17 & J01-20
J01-18 & J01-19
J03-3 & J03-5

Not susceptible
Not susceptible
Not susceptible

6.3.3 Magnetic Induced, Cable

Cables Tested

Test Points Monitored Result

1284TC 1

J01-17 & J01-20
J01-18 & J01-19
J03-3 & J03-5

Not susceptible
Not susceptible
Not susceptible

1284TC 3

J01-17 & J01-20
J01-18 & J01-19
J03-3 & J03-5

Not susceptible
Not susceptible
Not susceptible

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6.4

It should be noted that the limits of Reference 1.4 are referred to throughout this report solely as a basis for discussion of test results, since no limits were specified in the Test Requirements Document as required per D2-9801, paragraph 5.1.

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7.0

CONCLUSIONS

The test results show that broadband and CW conducted, and radiated broadband interference exceed the limits of Reference 1.4. No radiated CW interference was detected.

The Test Item was not susceptible to the applied tests.

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RECOMMENDATIONS

It is recommended that a review of enclosed test data be made to determine whether electro-interference characteristics of the Test Item are compatible with System operations.

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Photographs

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NF-105 Conducted	20
NF-105 Radiated V/A (15 - 150 KC)	21
NF-105 Radiated V/A (15 - 25 MC)	22
NF-105 Radiated D/A (25 - 400 MC)	23
RF Conducted Susceptibility	24
Magnetic Induced Susceptibility	25

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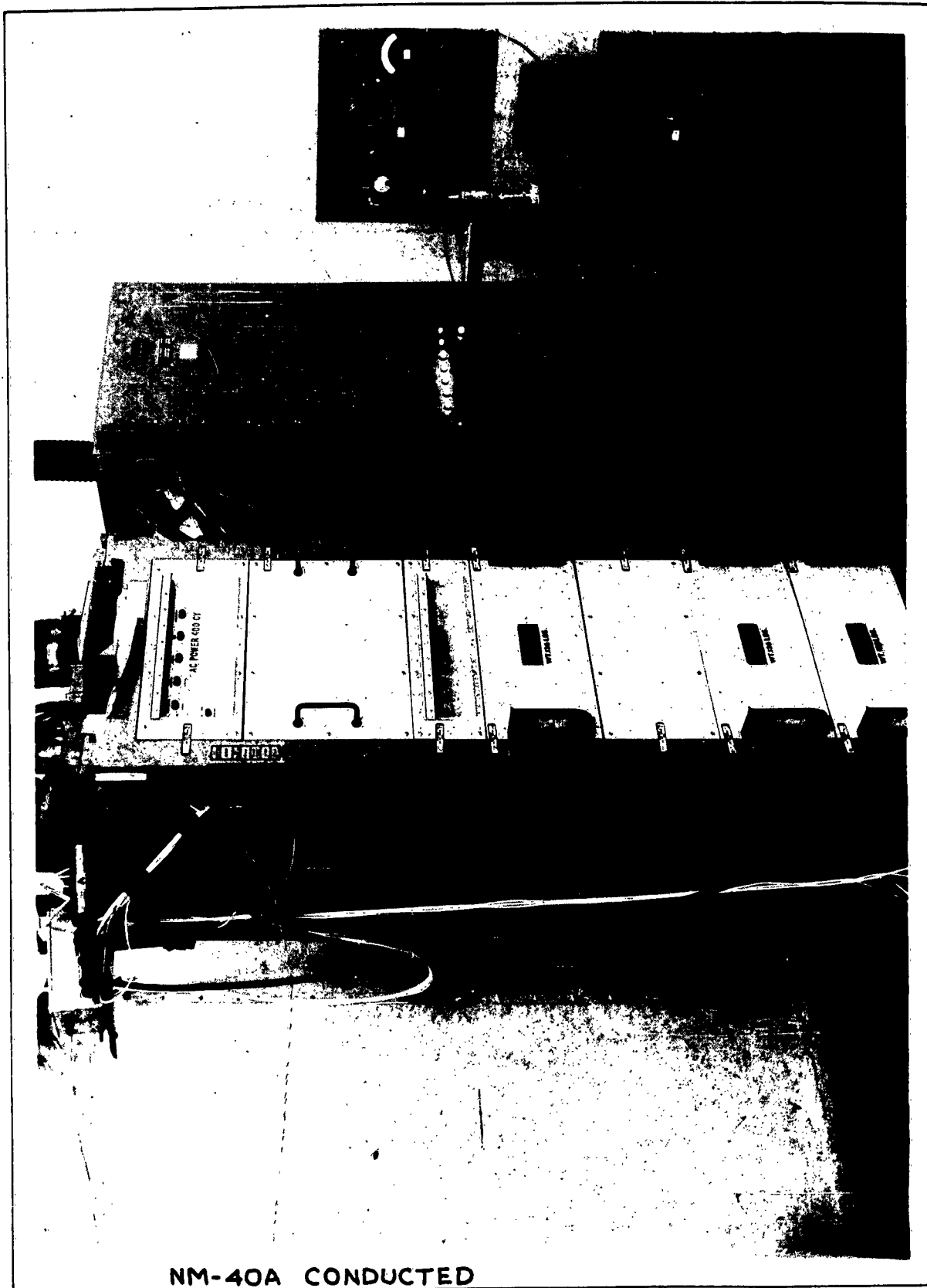
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BOEING SEATTLE NM- RT TEST ON POWER
 SUPPLY SET D.C., L.F. (FIG. A 128)
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NM-40A CONDUCTED
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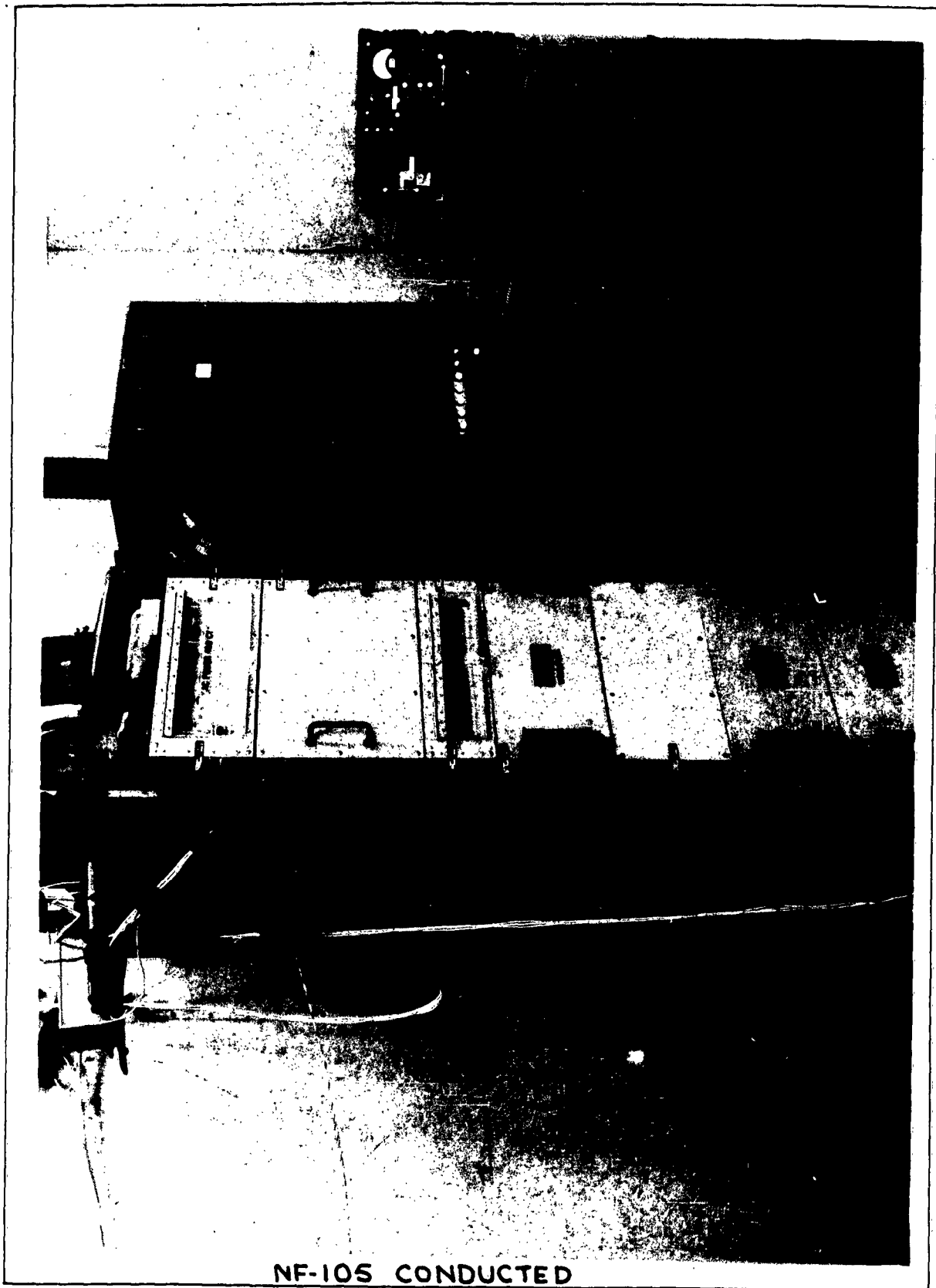
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BOEING SEATTLE WA- RPT TEST ON POWER 2A131943
 SUPPLY SET D.C., L.F. (FIG. A 1204)
 3-1-63



NF-105 CONDUCTED
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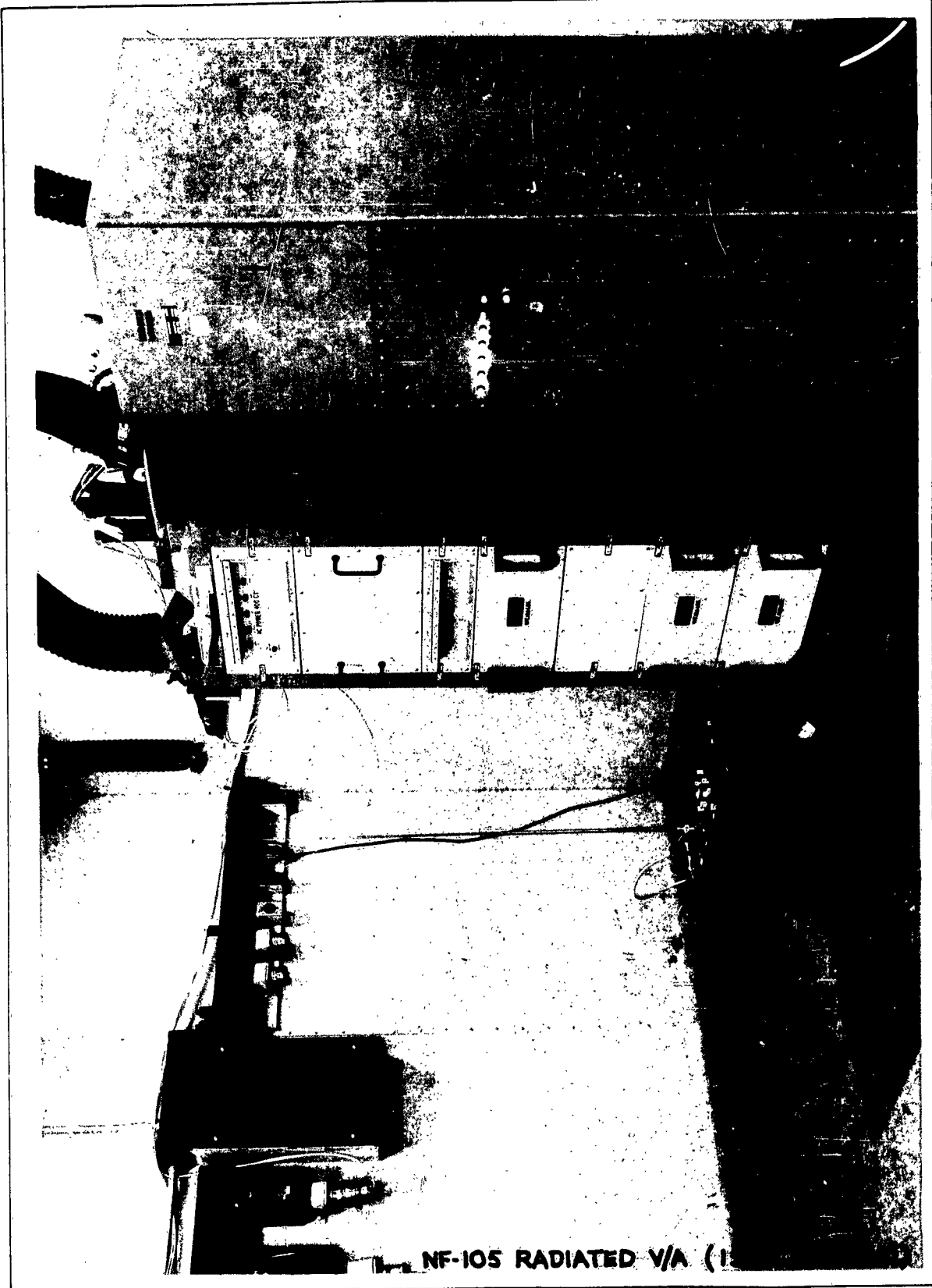
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BOEING SEATTLE WA- RFI TEST ON POWER 2A131347
 SUPPLY SET D.C., L.P. (FIG. A 1284)
 3-1-63



NF-105 RADIATED V/A (1

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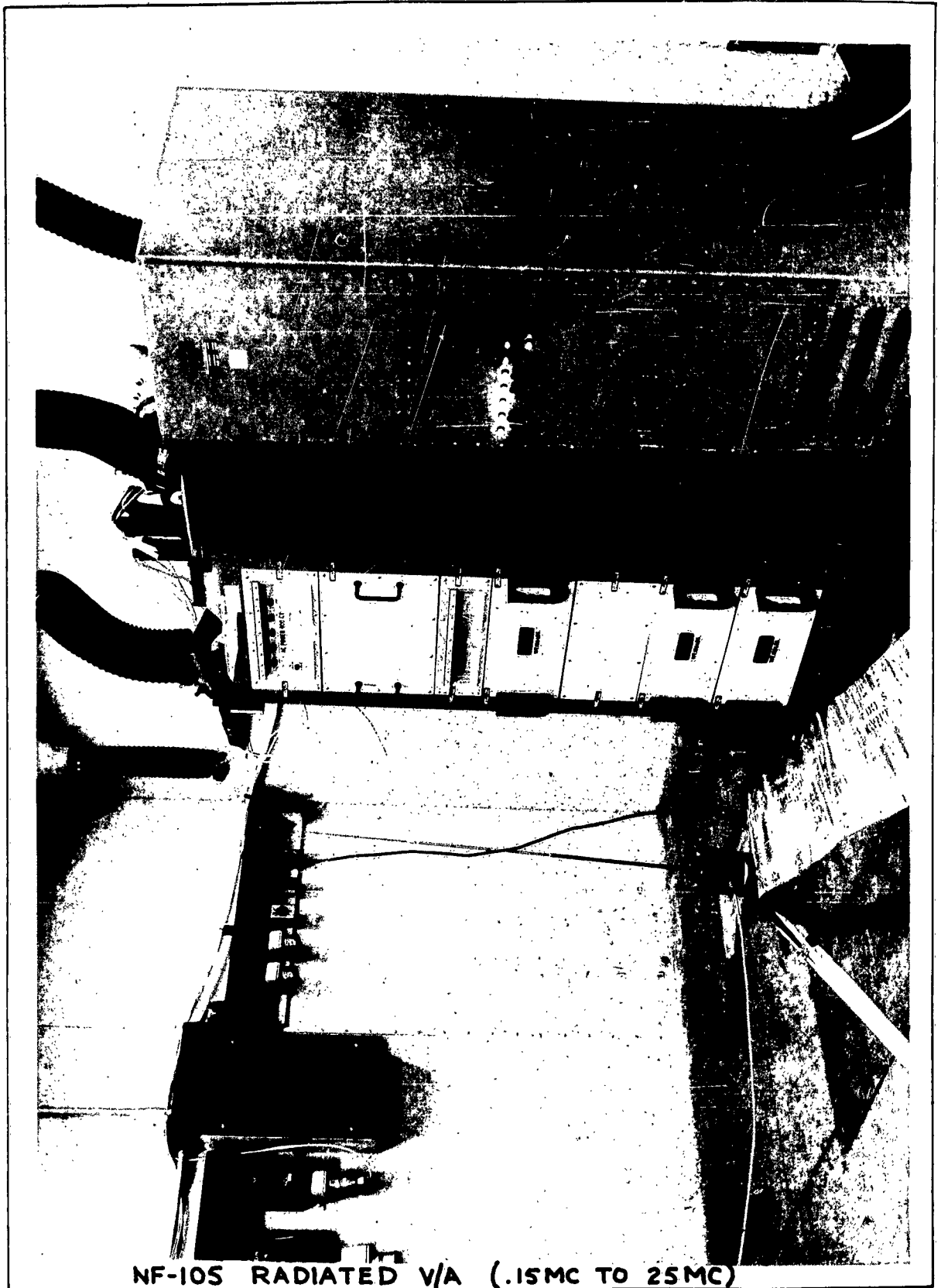
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BOEING SEATTLE WA- RPT. TEST ON POWER 2A1319-15
 SUPPLY SET D.C., L.R. (FIG. A 126A)
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NF-105 RADIATED V/A (.15MC TO 25MC)

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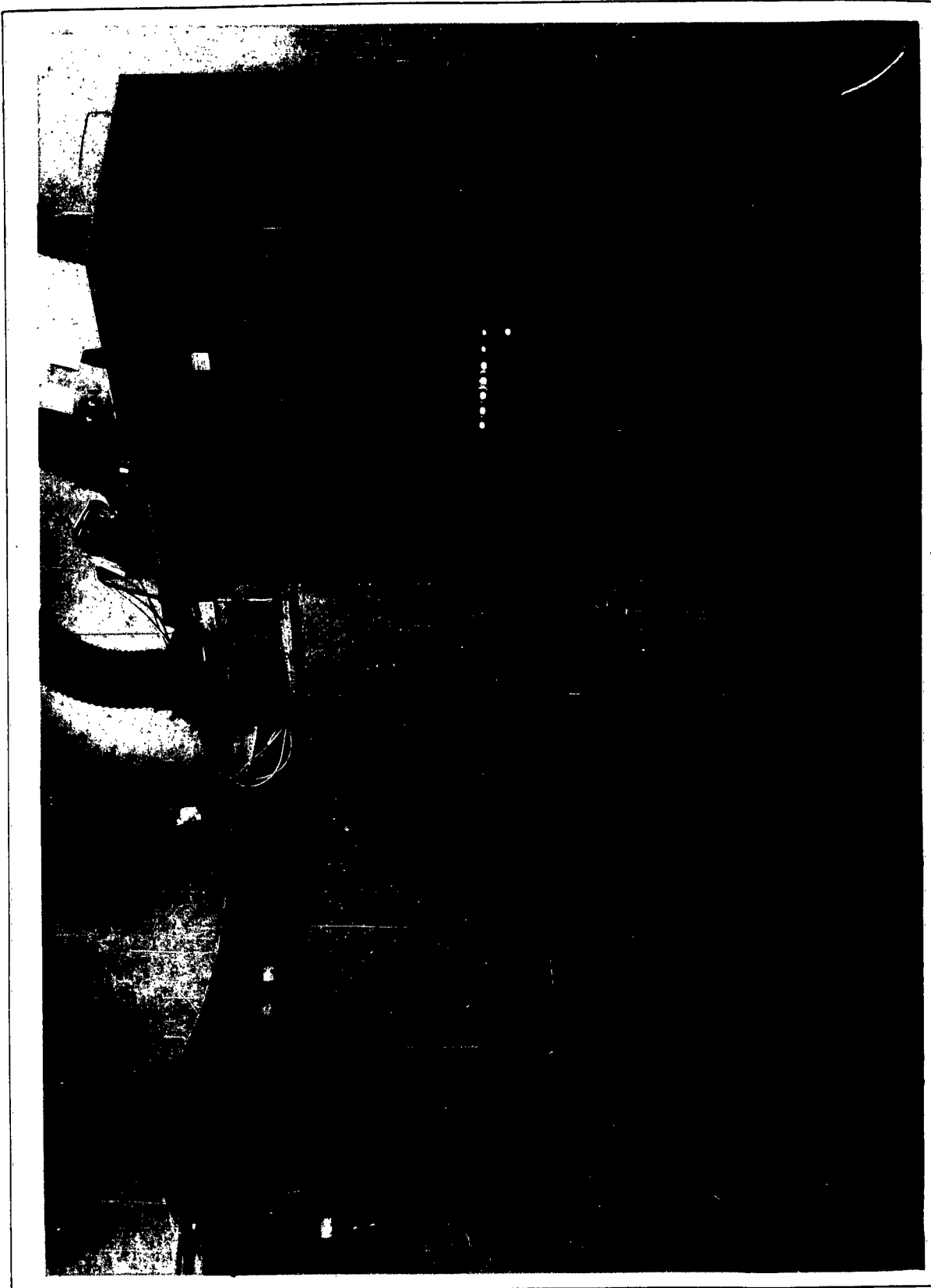
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BOEING SEATTLE MA- RTI TEST ON POWER 2A131918
 SUPPLY SET D.C., L.F. (FIG. A 128)
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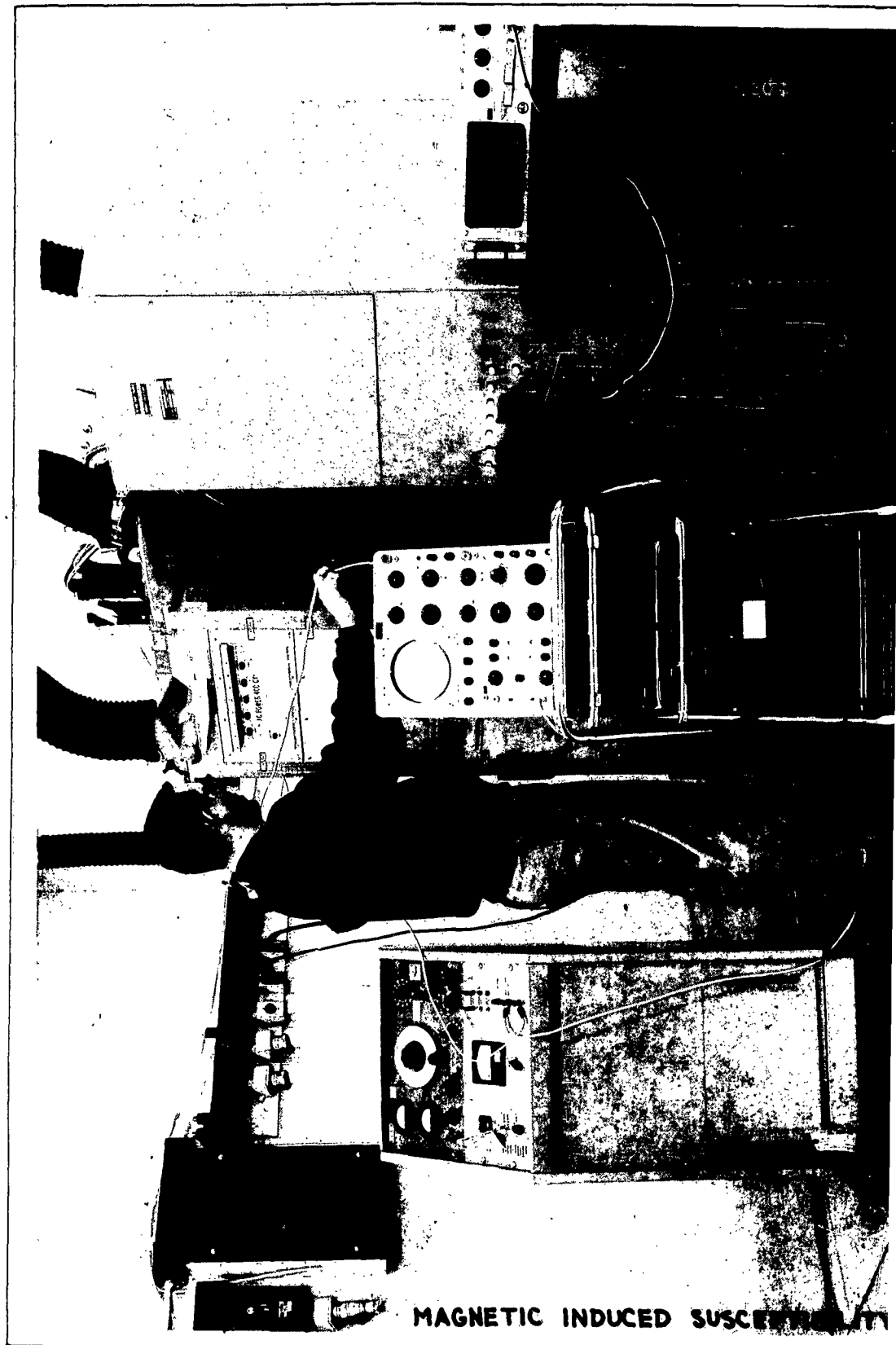


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BOEING SEATTLE MM- MI TEST ON POWER
SUPPLY SET D.C., 12 (FIG. A 1284)
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MAGNETIC INDUCED SUSCEPTIBILITY

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APPENDIX II

Test Equipment and Facilities

1.0 Test Item

The article under test was the Power Supply Set, DC, LF, Figure A 1284, Serial Number 0004.

2.0 Load

Load Simulator, 25-28997

3.0 The electro-interference tests were conducted in a shielded room, Eccoshield, 20' x 16' x 8', room number 24, located in the 9.101 Building.

4.0 Test Instruments

<u>Model No.</u>	<u>Manufacturer</u>	<u>Serial No.</u>	<u>Date of Last Calibration</u>	<u>Calibration Due</u>
------------------	---------------------	-------------------	---------------------------------	------------------------

4.1 Field Intensity Meters

NF-105	Empire Devices	1885	1-14-63	4-22-63
T-X/NF-105	Empire Devices	1571	2-5-63	5-14-63
NM-40A	Stoddart	310-4	2-15-63	3-15-63

4.2 Signal Generators

IG-115	Empire Devices	449	1-15-63	4-9-63
606A	Hewlett-Packard	038-01883	2-15-63	5-10-63
608C	Hewlett-Packard	1552	1-17-63	4-11-63
612A	Hewlett-Packard	1332	1-28-63	4-22-63
205AG	Hewlett-Packard	BAC 103375	2-14-63	5-16-63

4.3 Current Probe

91550-1	Stoddart	277-90	--	--
91550-1	Stoddart	245-25	--	--

4.4 Miscellaneous Equipment

<u>Model No.</u>	<u>Manufacturer and Type</u>	<u>Serial No.</u>	<u>Date of Last Calibration</u>	<u>Calibration Due</u>
50-W-2	McIntosh Amplifier	3615	12-27-62	6-17-63
545A	Tektronix Oscilloscope	024657	2-27-63	4-10-63
C-A	Tektronix Plug In Unit	012400	2-1-63	3-1-63
803	J. Fluke VT/VM	2557	2-26-63	3-26-63
481	Non Linear Sys. Digital Voltmeter	11.2729	2-15-63	3-14-63
744	AC Ammeter 30 Amp Shunt	BACX105085	10-19-62	4-12-63

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APPENDIX III

Sample Calculations

Broadband radiated measurements with NF-105 (Rod Antenna) (15 KC to 25 MC)

Frequency of Measurement - 105 KC	
Antenna Factor	29 DB
Cable Loss	0 DB
Impulse Generator Level (substitution method)	32 DB/ μ V/MC
Total antenna induced DB above one microvolt/MC BW	61 DB/ μ V/MC

Broadband radiated measurements with NF-105 (Dipole Antenna) (25 to 400 MC)

Frequency of Measurement - 100 MC	
Antenna Factor	8 DB
Cable Loss	0 DB
Impulse Generator Level (substitution method)	82 DB/ μ V/MC
Total antenna induced DB above one microvolt/MC BW	90 DB/ μ V/MC

Broadband current probe conducted measurements with NM-40A

Frequency of Measurement (wide band position 30 cps - 20 KC)	
Meter Reading	113 DB/ μ A/20 KC
Cable Loss	0 DB
Corrected total DB above one microampere per 20 KC bandwidth	113 DB

Broadband current probe conducted measurement with NF-105 (15 KC to 25 MC)

Frequency of Measurement - 15 KC	
Cable Loss	0 DB
Current Probe Factor	+15 DB/ohm
Impulse Generator Level (substitution method)	146 DB/ μ V/MC
Total DB above one microampere/MC BW	161 DB/ μ A/MC

CW current probe conducted measurement with NF-105 (15 KC to 25 MC)

Frequency of Measurement - 60 KC	
Cable Loss	0 DB
Current Probe Factor	+3 DB/ohm
Meter Reading (DB scale)	72 DB/ μ V
Total DB above one microampere	75 DB/ μ A

Added 4-8-63

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APPENDIX IV

Plotted Test Data

1.0 Radiated Interference

<u>Frequency</u>	<u>Mode</u>	<u>Test Point</u>	<u>Page</u>
15 KC - 400 MC	TH		30
	AMB		31
	1		32
	2		33
15 KC - 400 MC	3		34

2.0 Conducted Interference

2.1 Broadband

<u>Frequency</u>	<u>Mode</u>	<u>Test Point</u>	<u>Page</u>
30 cps - 15 KC	TH		36
15 KC - 25 MC	TH		35
30 cps - 15 KC	1	J09-1	36
		J09-2	36
		J09-3	36
	1	J09-4	36
	2	J09-1	36
		J09-2	36
		J09-3	36
		J09-4	36
		TP-1	36
	2	TP-2	36
	3	J09-1	36
		J09-2	36
		J09-3	36
		J09-4	36
		TP-2	36
		TP-3	36
		TP-4	36
		TP-5	36
30 cps - 15 KC	3		
15 KC - 25 MC	1	J09-1	37
		J09-2	38
		J09-3	39
	1	J09-4	40
	2	J09-1	41
		J09-2	42
		J09-3	43
		J09-4	44
15 KC - 25 MC		TP-1	45
	2	TP-2	46

Added 4-8-63

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APPENDIX IV (continued)

2.1 Broadband (continued)

<u>Frequency</u>	<u>Mode</u>	<u>Test Point</u>	<u>Page</u>
15 KC - 25 MC	3	J09-1	47
		J09-2	48
		J09-3	49
		J09-4	50
		TP-2	51
15 KC - 25 MC	3	TP-3	52
		TP-4	53
		TP-5	54

2.2 CW

<u>Frequency</u>	<u>Mode</u>	<u>Test Point</u>	<u>Page</u>
15 KC - 25 MC	1	J09-1	55
		J09-2	56
		J09-3	57
		J09-4	58
		J09-1	59
15 KC - 25 MC	2	J09-2	60
		J09-3	61
		J09-4	62
		TP-1	63
		TP-2	64

Added 4-8-63

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U3 4288 2000

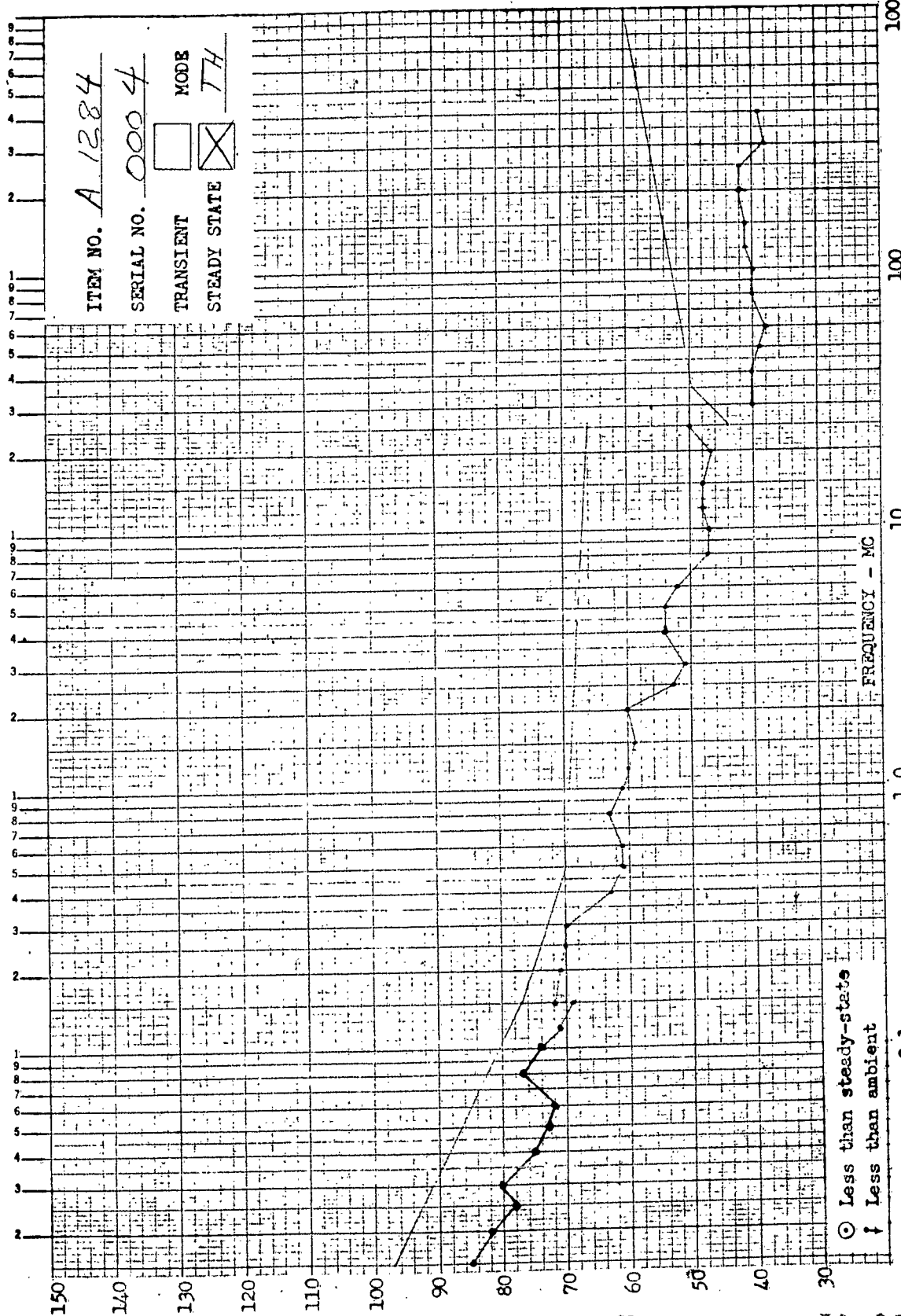
BOEING

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Data on page 67-8

BROADBAND AND PULSED CW RADIATED DATA

2-5493-0-3

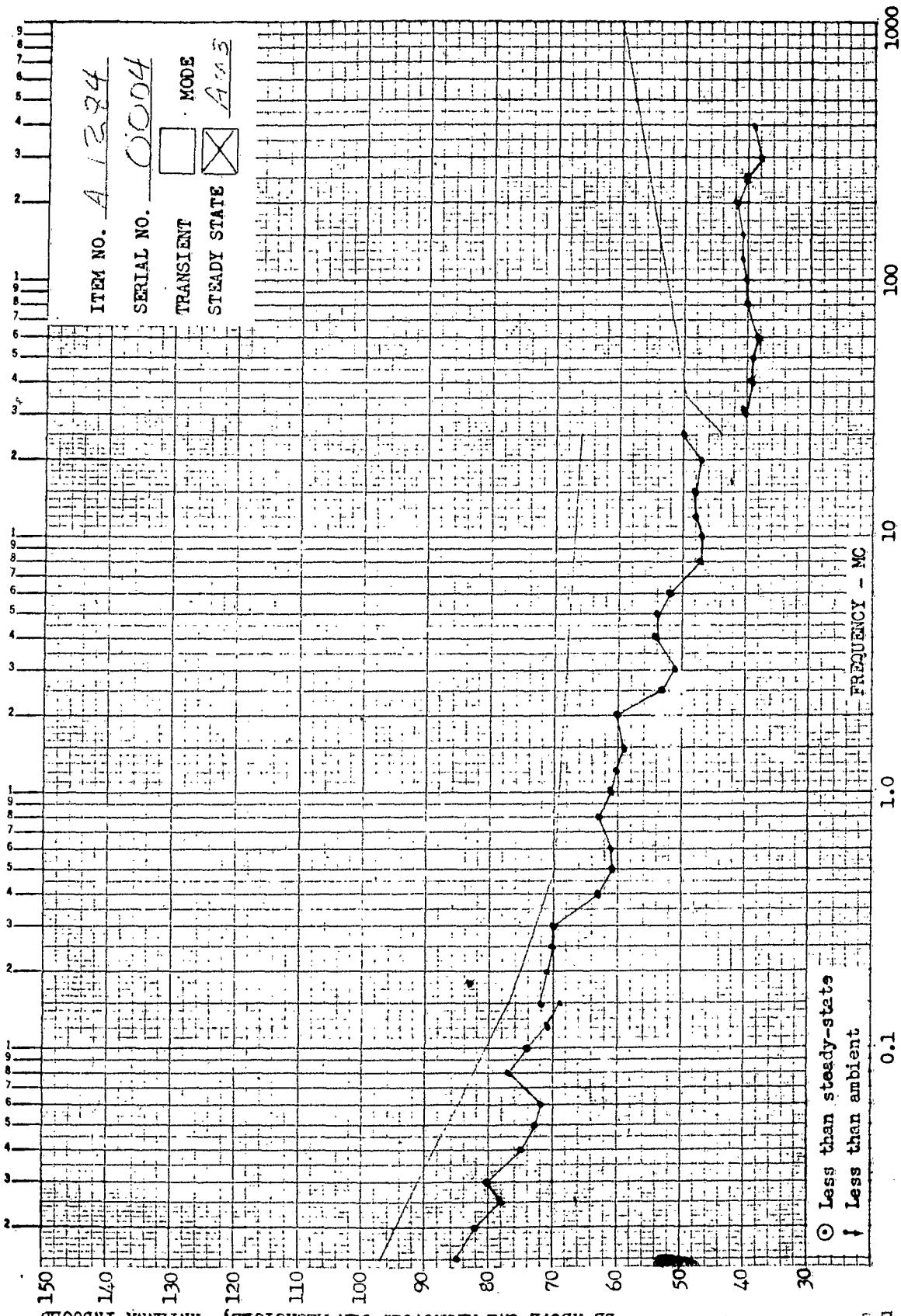
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GN1300

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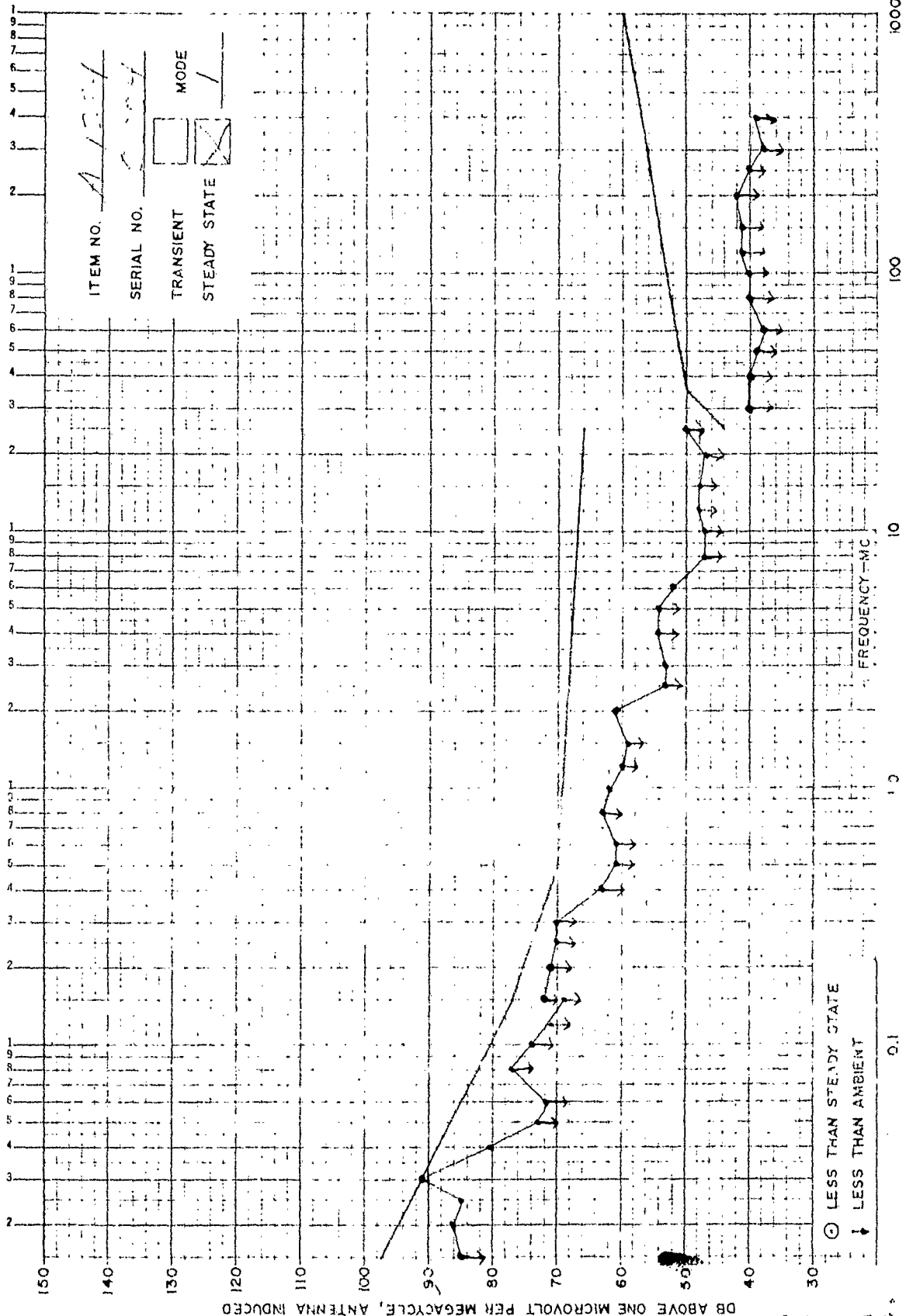
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ITEM NO. A 1384
 SERIAL NO. 0004
 TRANSIENT ☐ MODE ☒
 STEADY STATE ☒ ANS

Data on page 69-70

BROADBAND AND PULSED CW RADIATED DATA



DATA ON PAGE 71-2

BROADBAND AND PULSED CW RADIATED DATA

2-0493-0-3

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NO

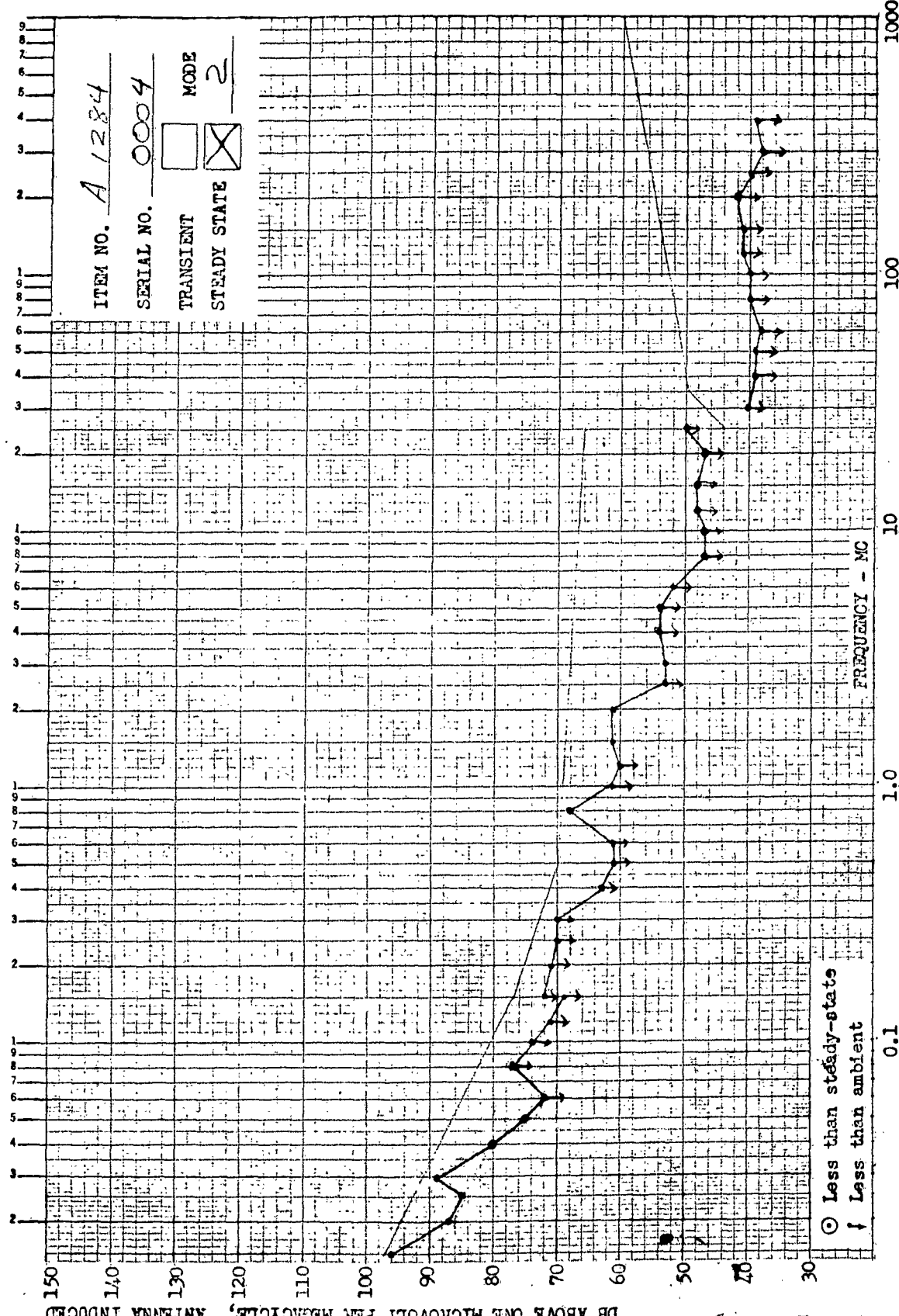
12 2700

SFC

III

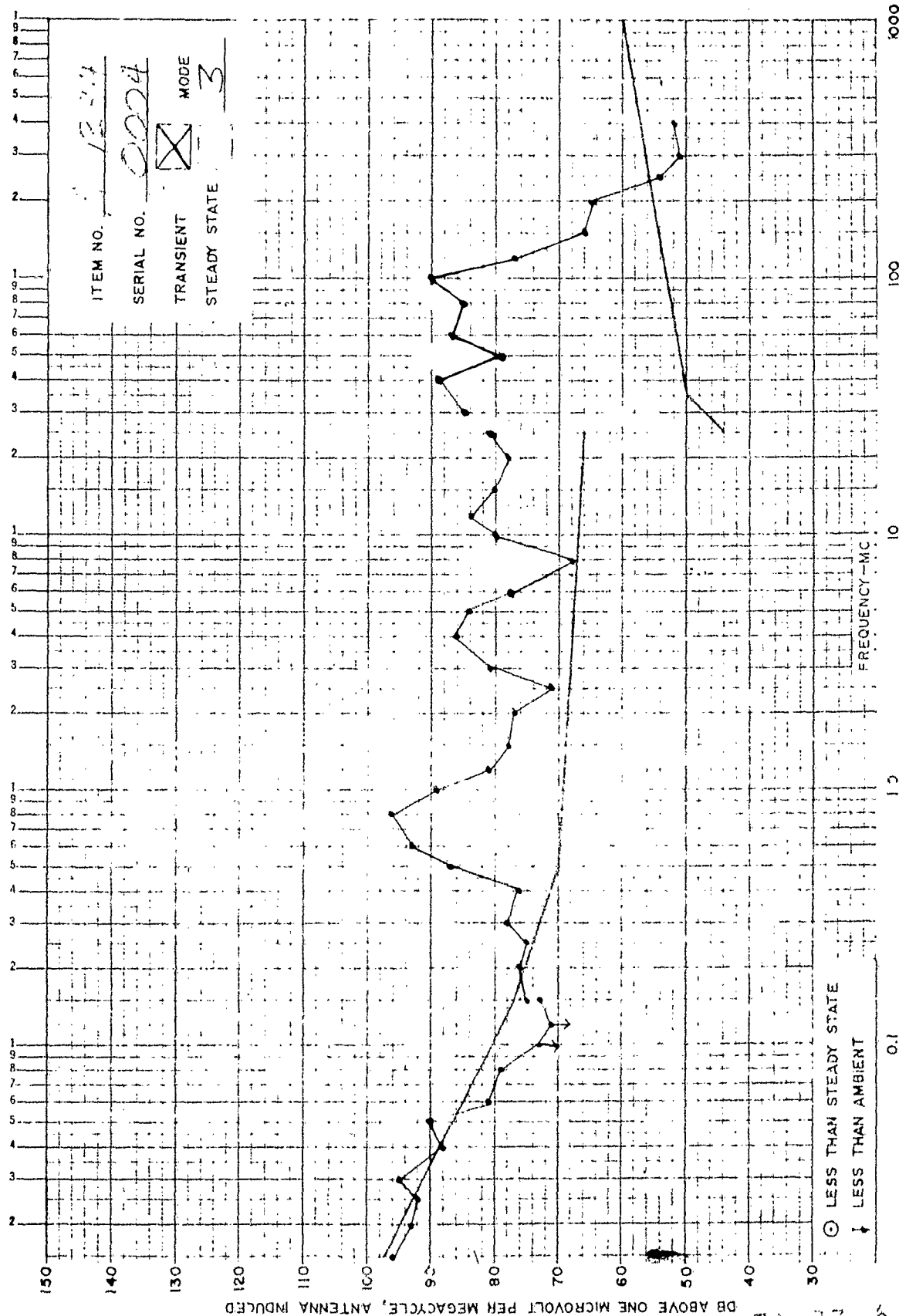
PAGE

32



Data on page 73-4

BROADBAND AND PULSED CW RADIATED DATA



DATA ON PAGE 75-6

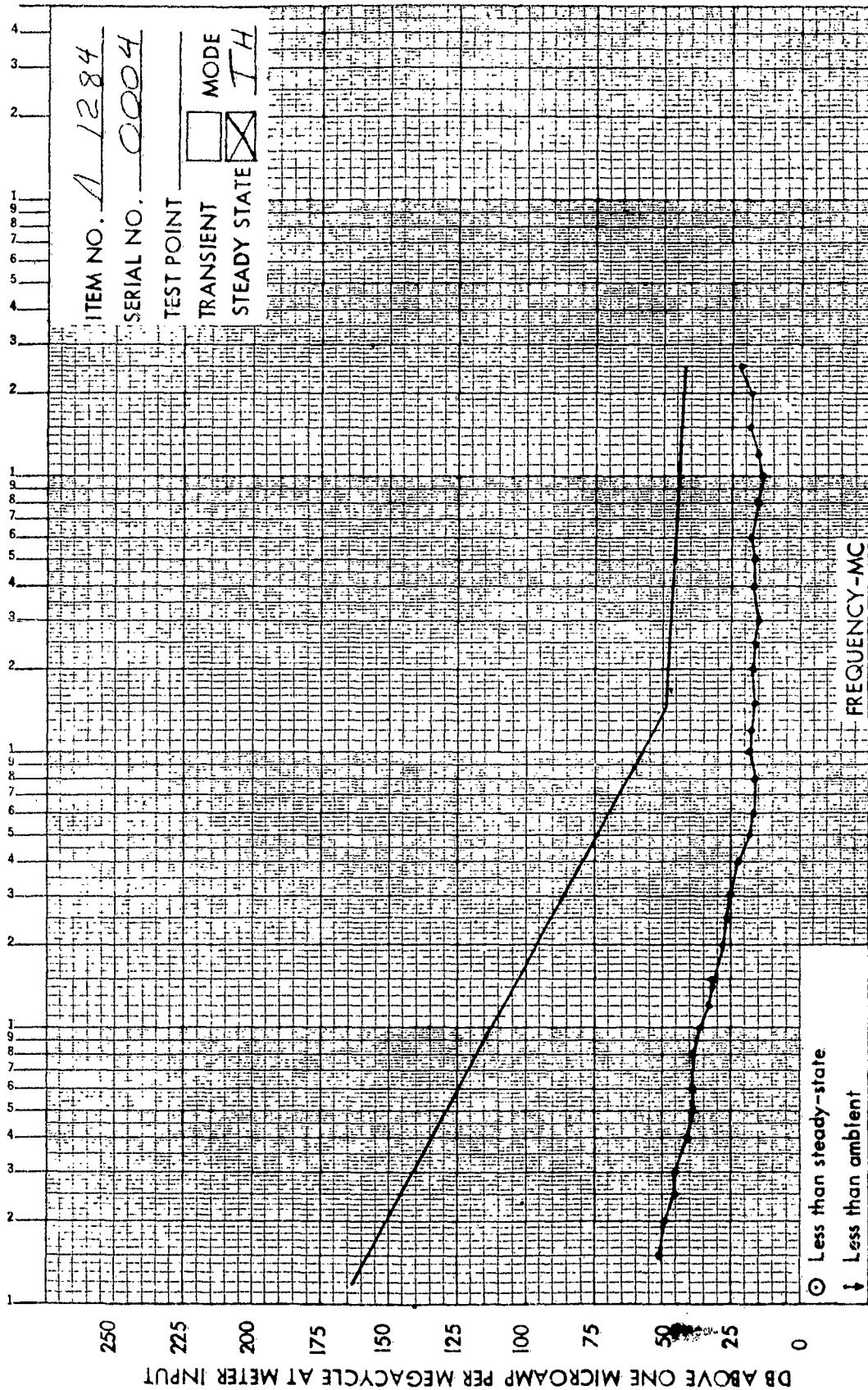
BROADBAND AND PULSED CW RADIATED DATA

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BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

78-9

Data on page

2-5493-0-5

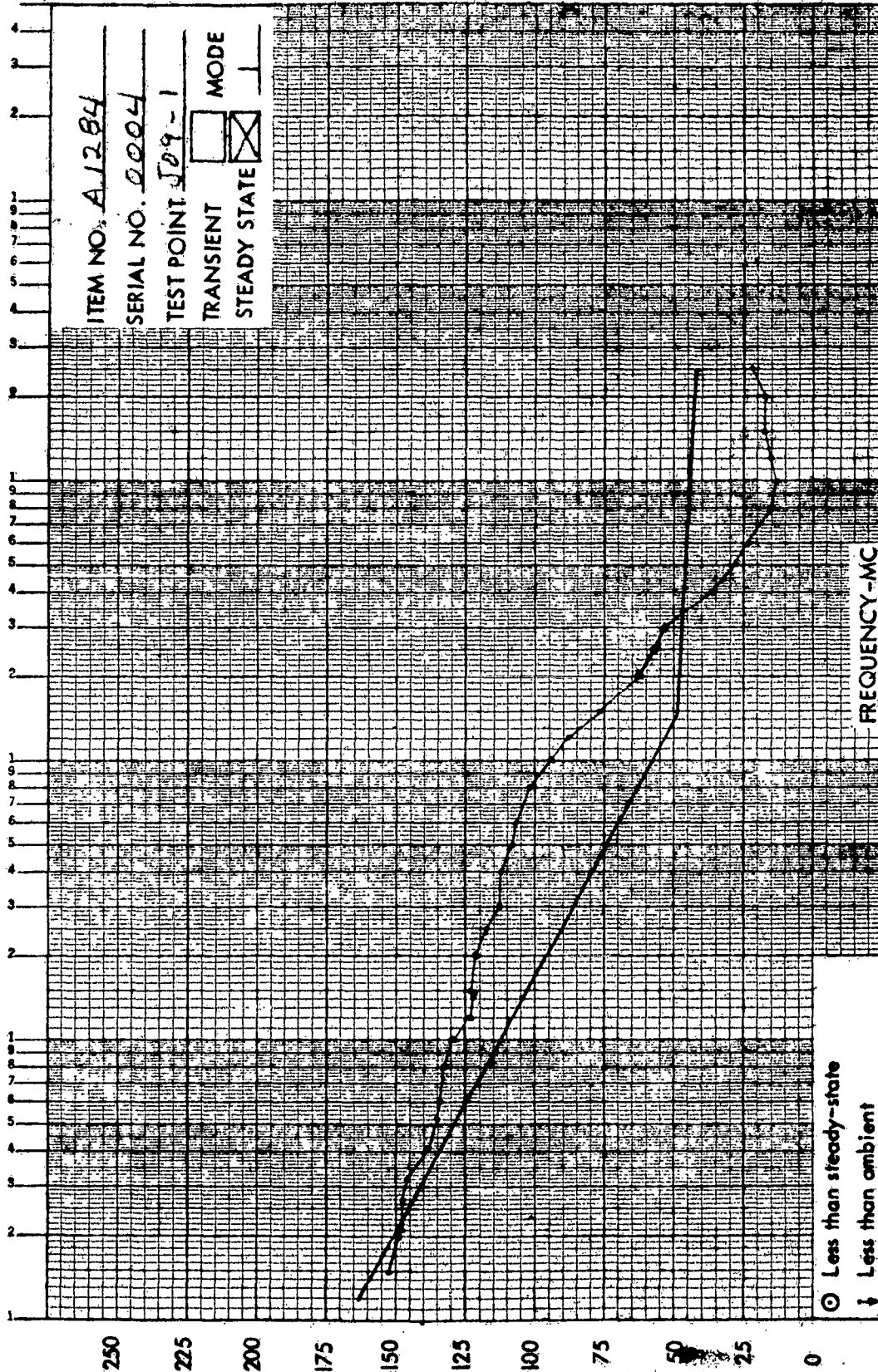
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Data on page

BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

2-5493-0-5

APR 8 1963

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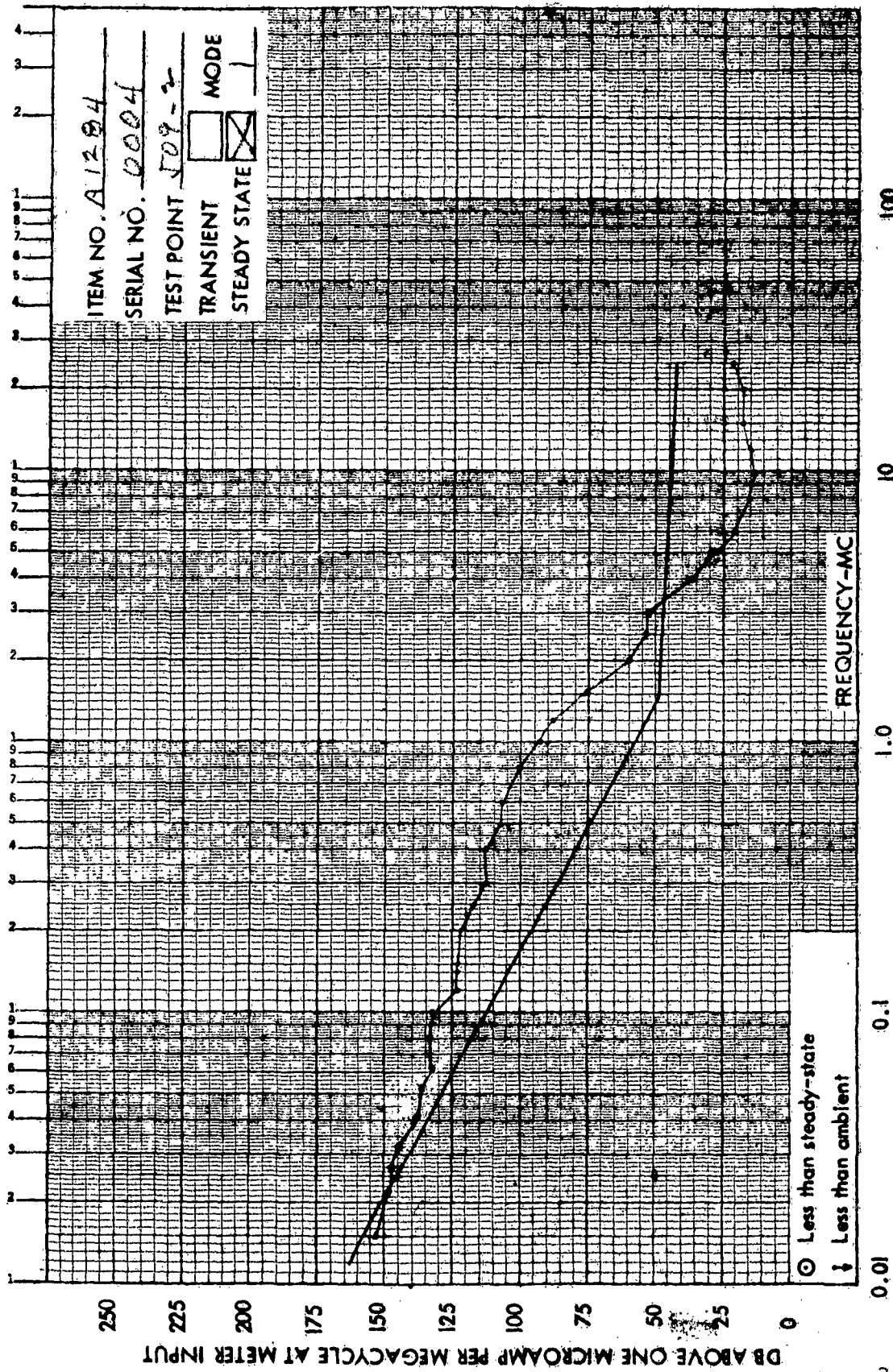
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BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

83-4

Data on page

2-5493-0-5

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2-5493-0-5

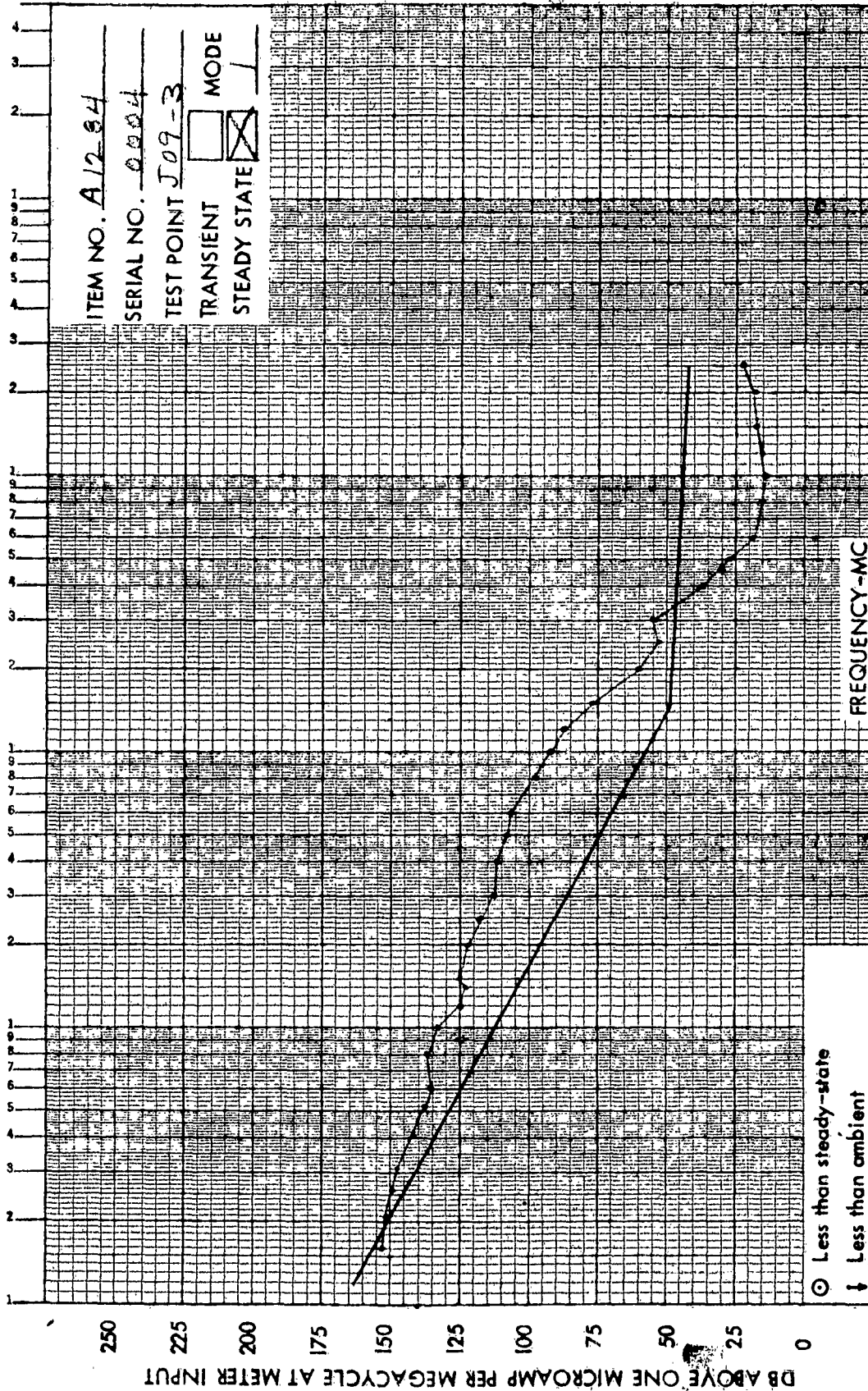
APR 8 1963

BOEING

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SEC. III

NO 12-2780
PAGE

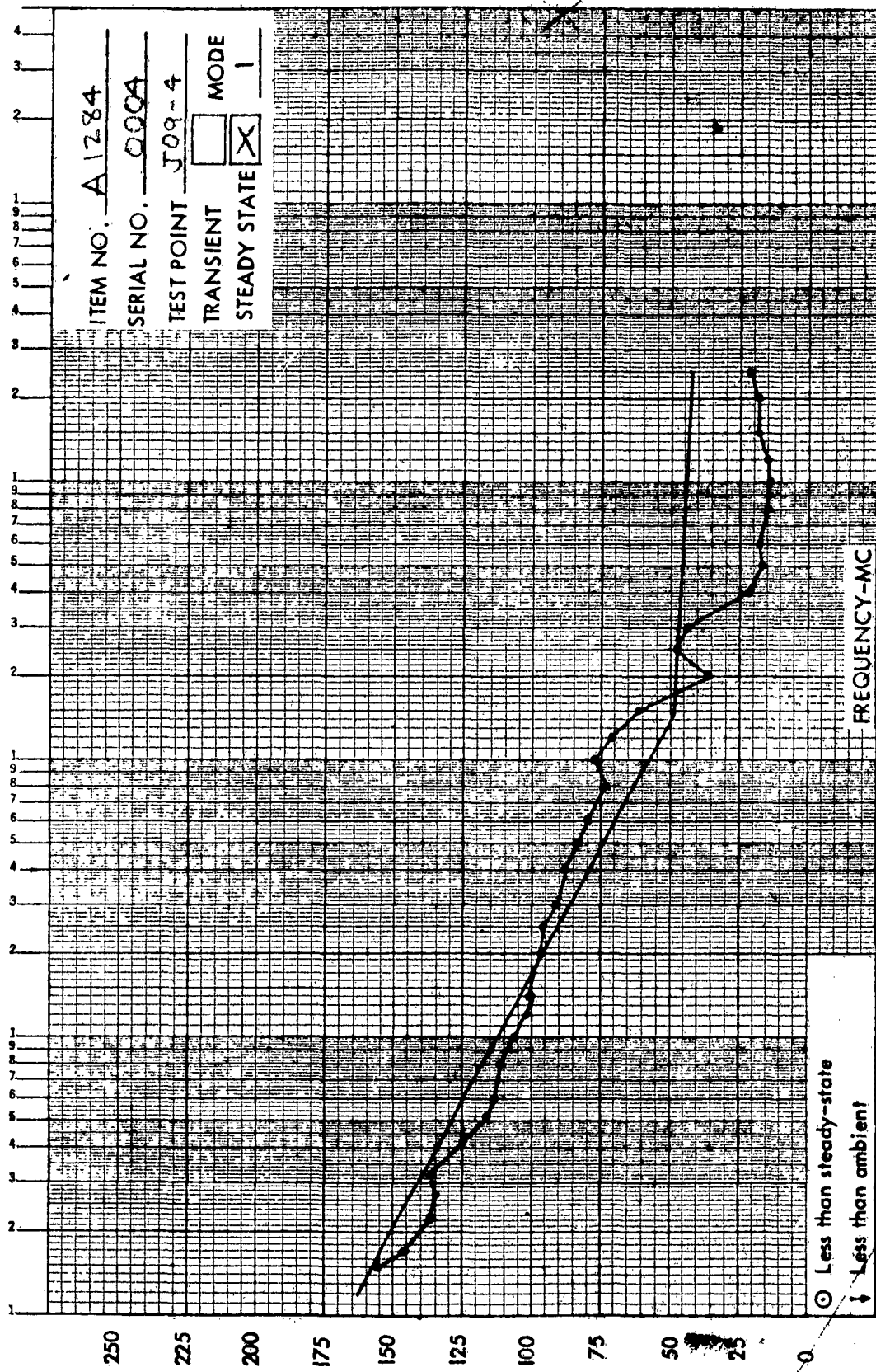
39



BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

Data on page

85-6



BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

87-8

Data on page

2-5493-0-5

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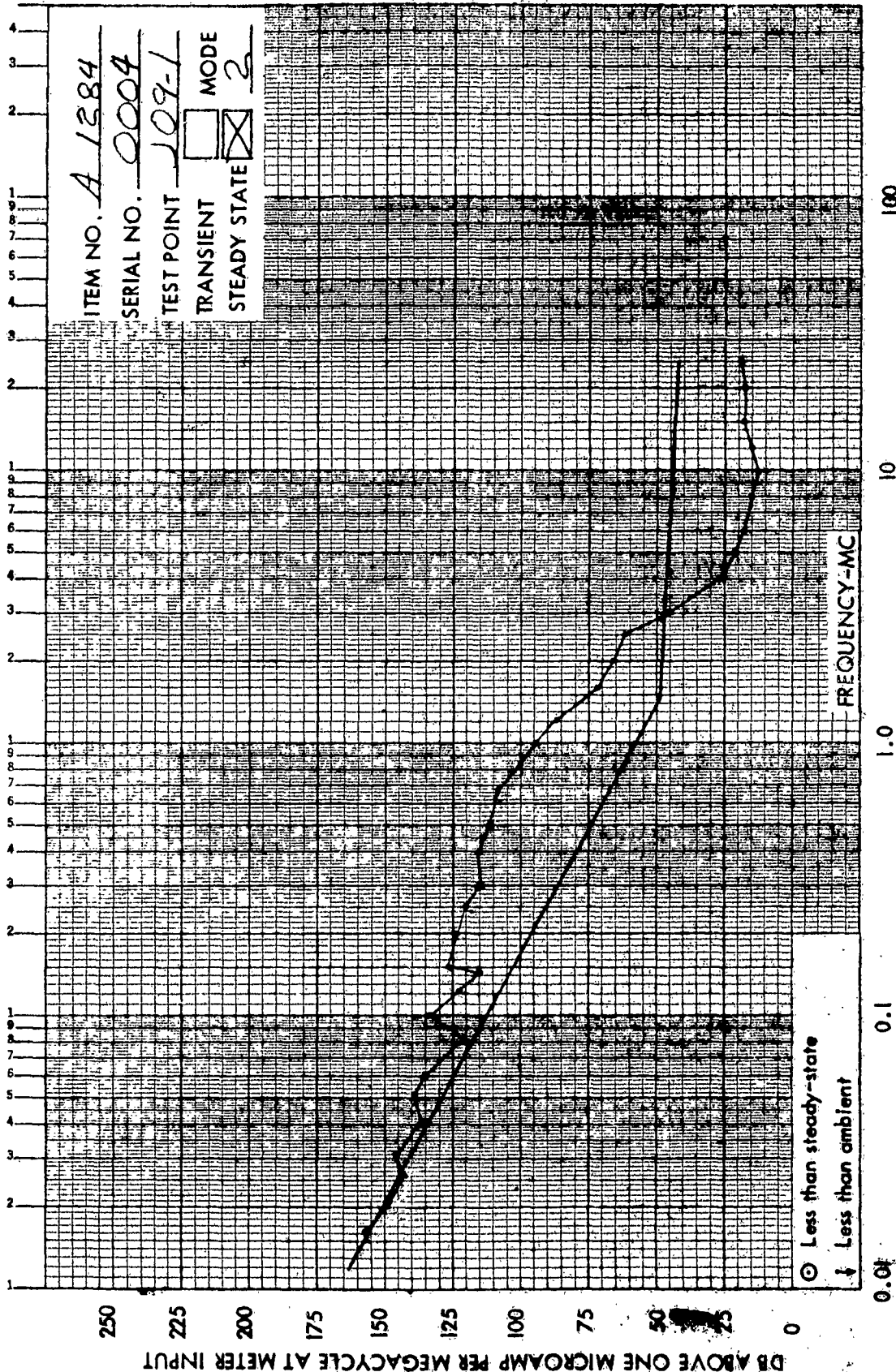
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APR 8 1963

ONBOARD

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SEC III

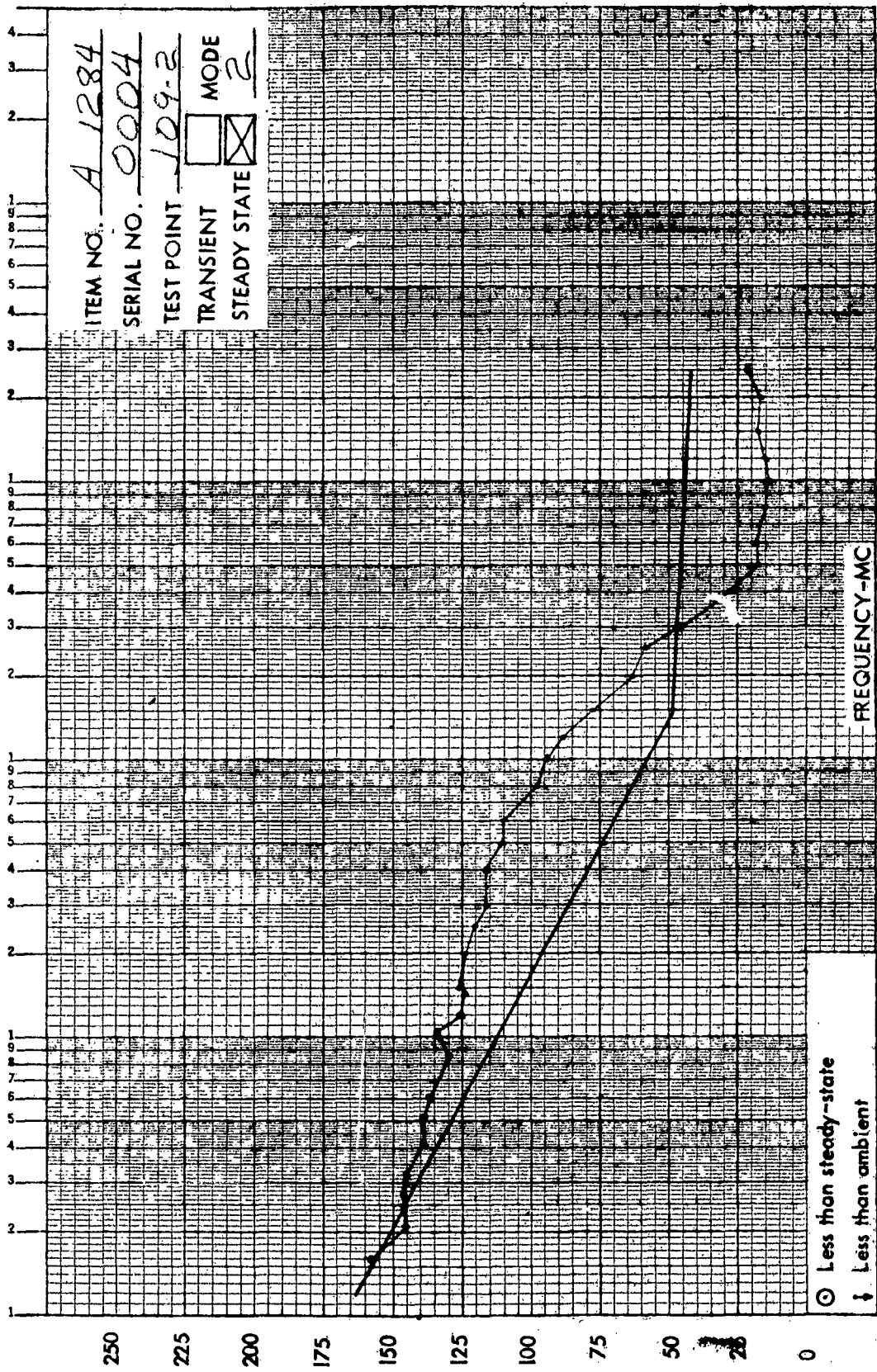
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PAGE 4



ITEM NO. A 1284
SERIAL NO. 0004
TEST POINT 109-1
TRANSIENT ☐
STEADY STATE ☒ MODE 2

BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

Data on page 79-90



0.01 0.1 1.0 10 100

91-2

BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

Data on page

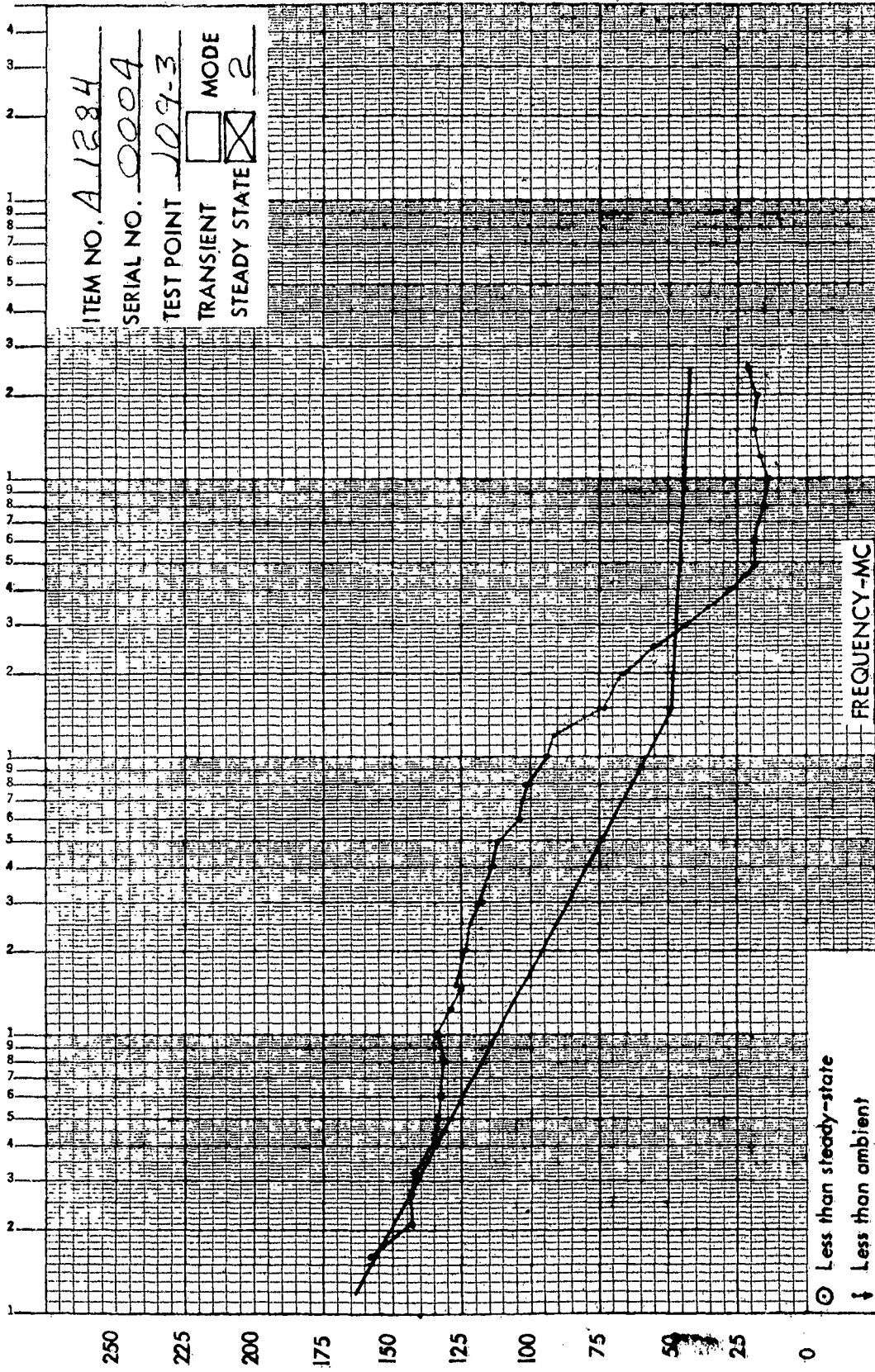
2-5493-0-5

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BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

93-4

Data on page

2-5493-0-5

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NO

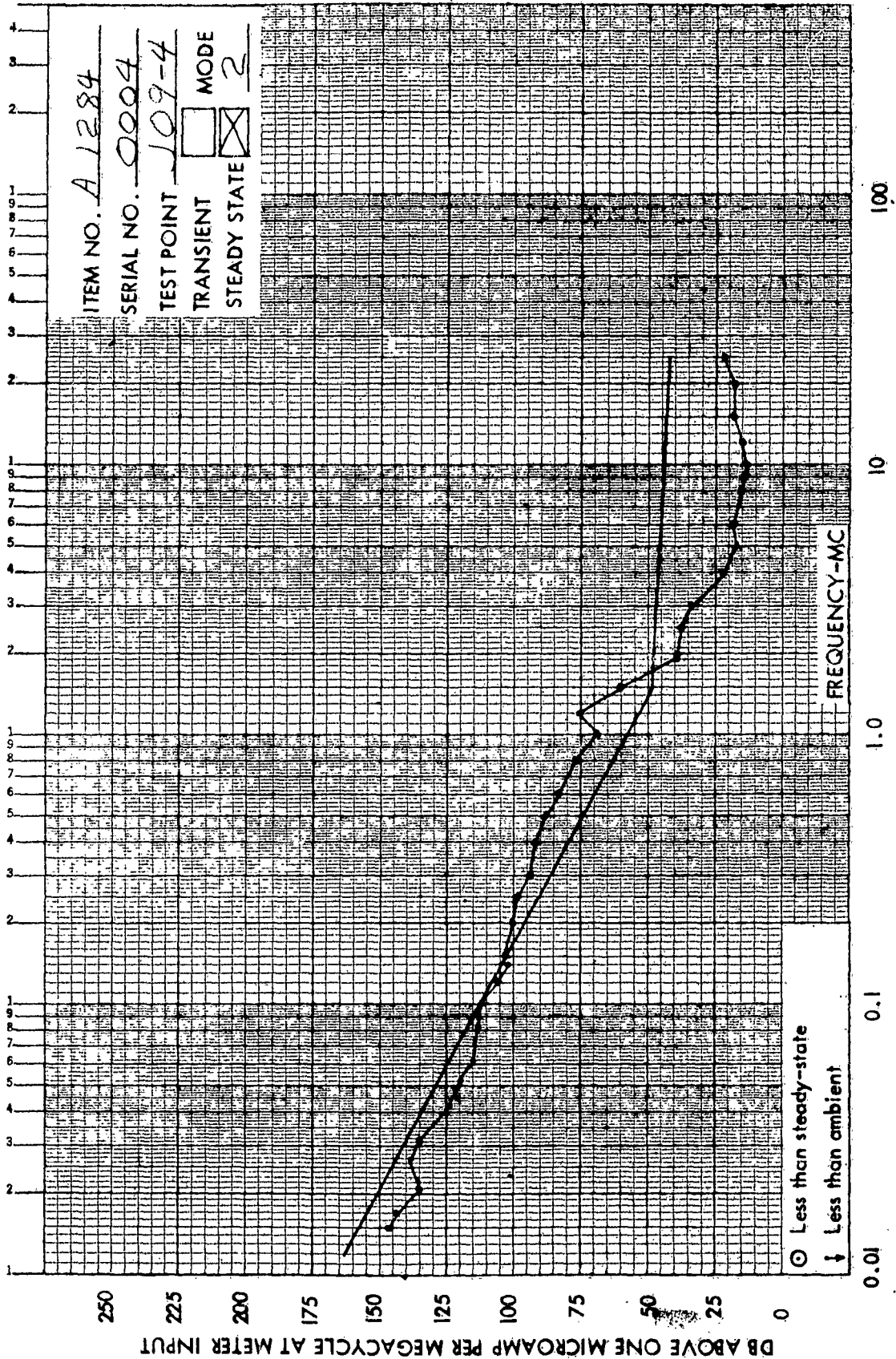
SEC.

III

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9817-21



BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

95-6

Data on page

2-5493-0-5

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SEC		PAGE 44	

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NO

PAGE

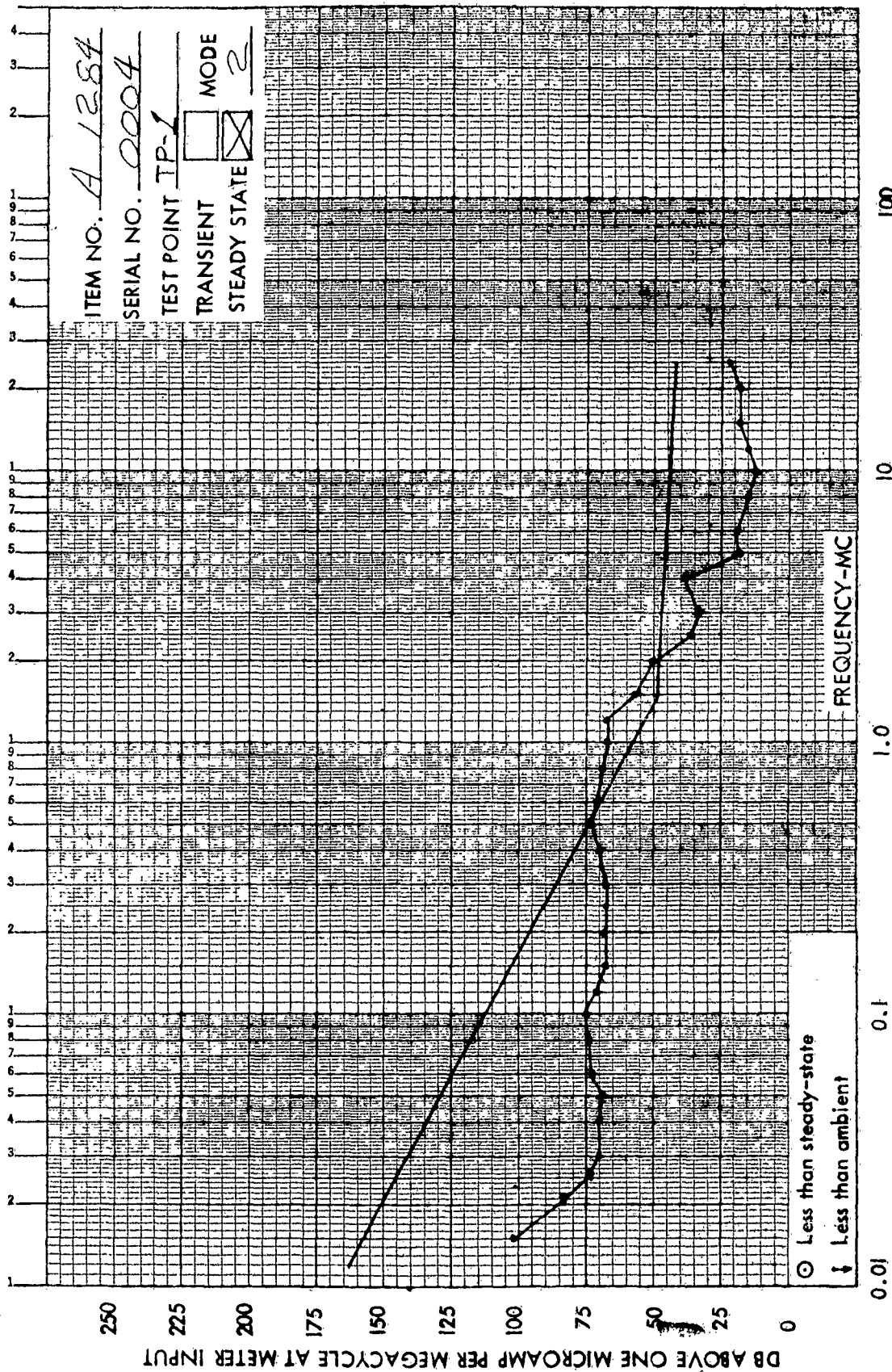
45

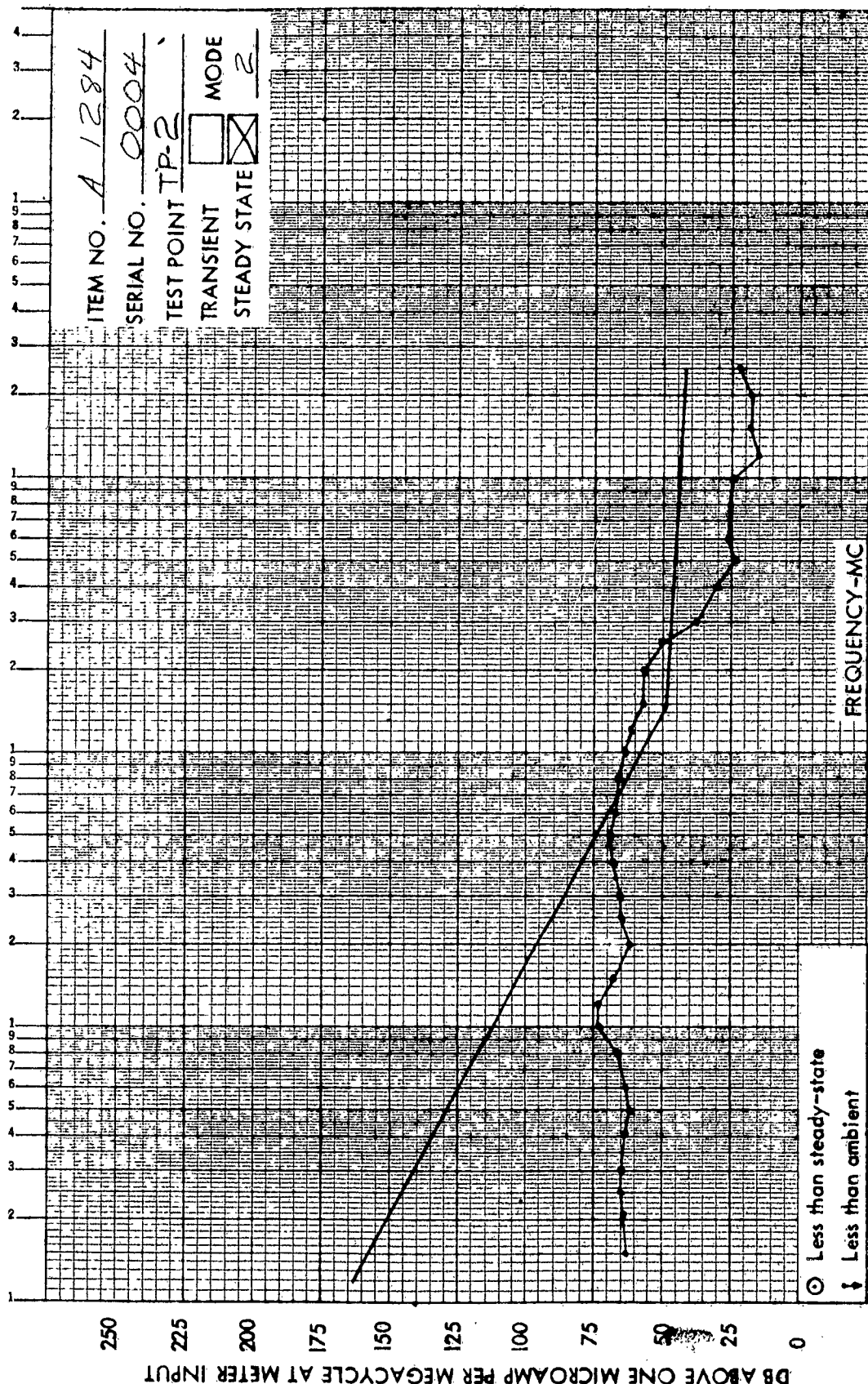
NO 2-2786

97-8

Data on page

BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE





ITEM NO. A 1284
 SERIAL NO. 0004
 TEST POINT TP-2
 TRANSIENT ☐ MODE ☒
 STEADY STATE ☒ 2

99, 100

Data on page

BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

2-5493-0-5

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2-5493-0-5

APR 8 1963

BOEING

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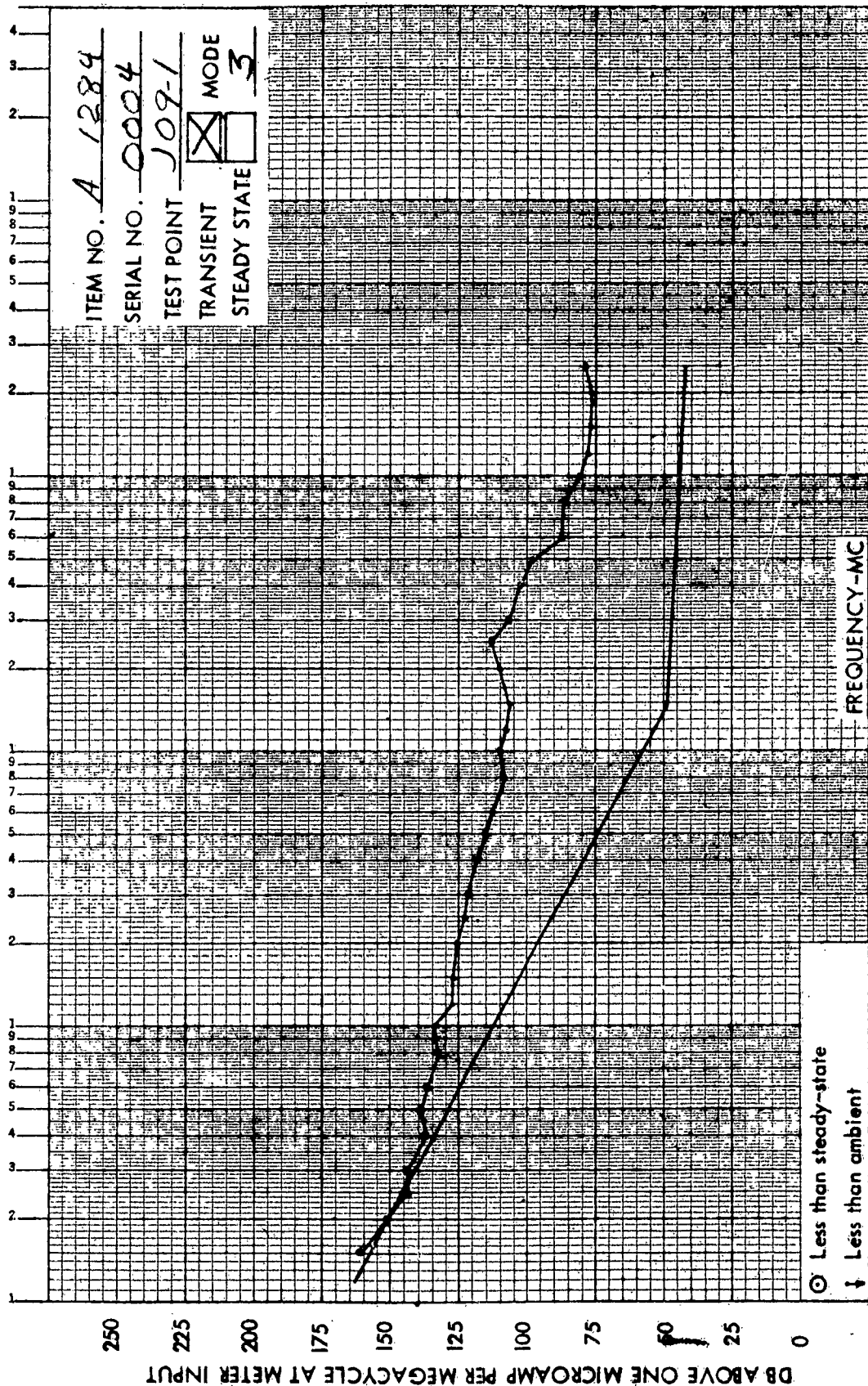
SEC.

NO

PAGE

47

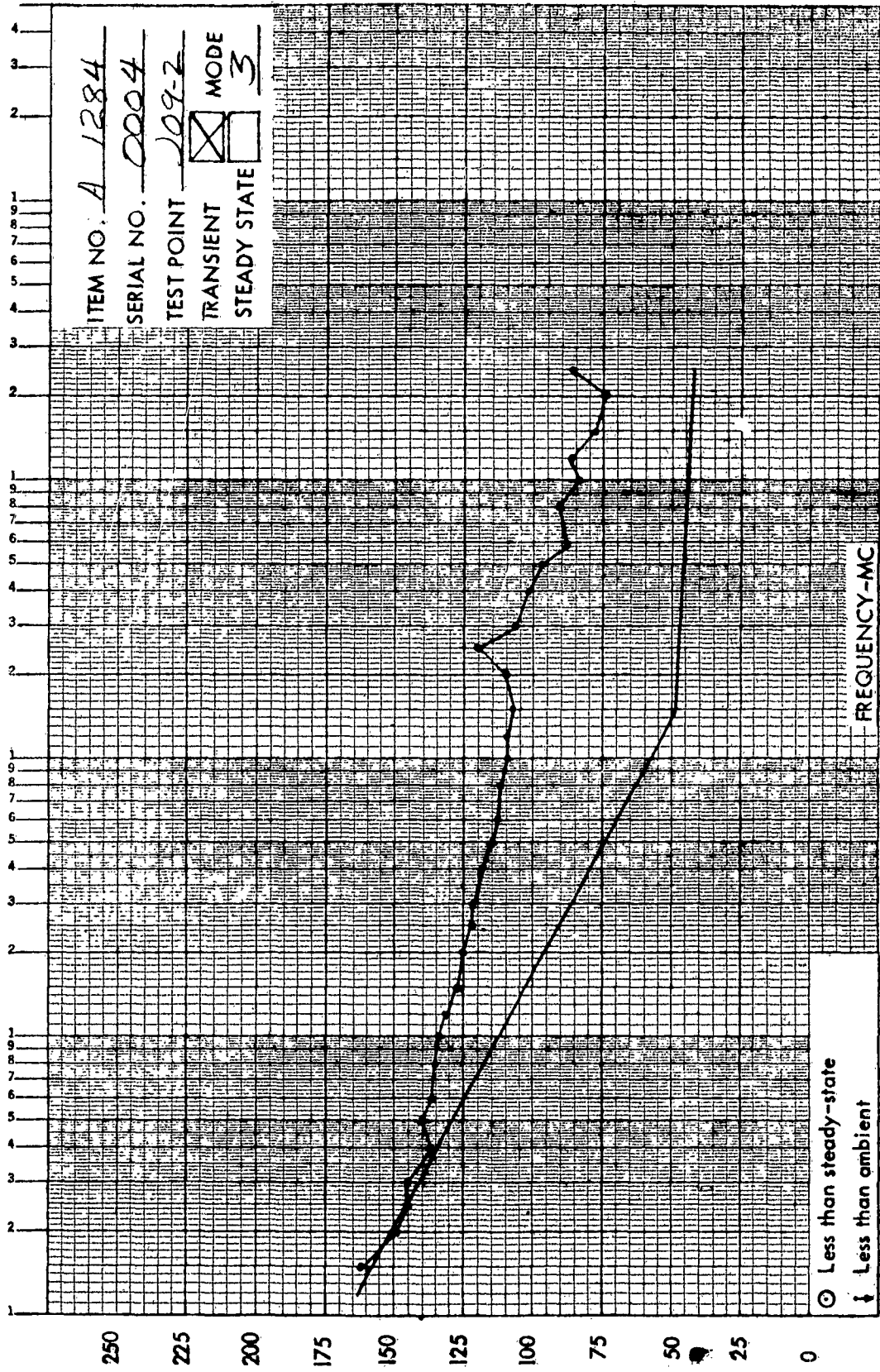
9822-21



BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

Data on page

101-2



BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

Data on page

103-4

2-5493-0-5

APR 8 1968

UNION

VOL. II
 SEC. III

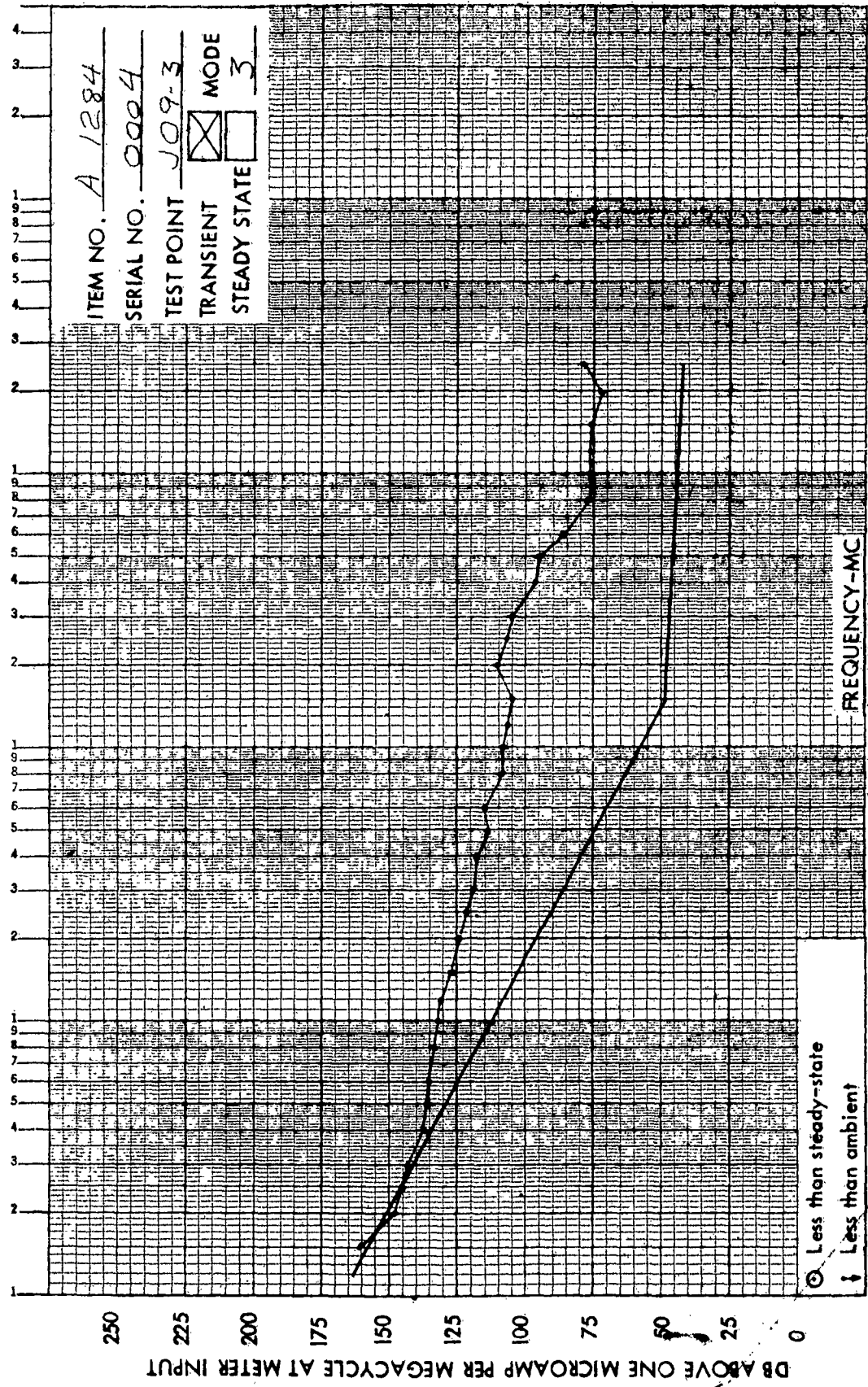
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7-1

2-1



2-5493-0-5

APR 8 1963

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BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

105-6

Data on page

2-5493-0-5

APR 8 1969

BOEING

VOL

II

NO

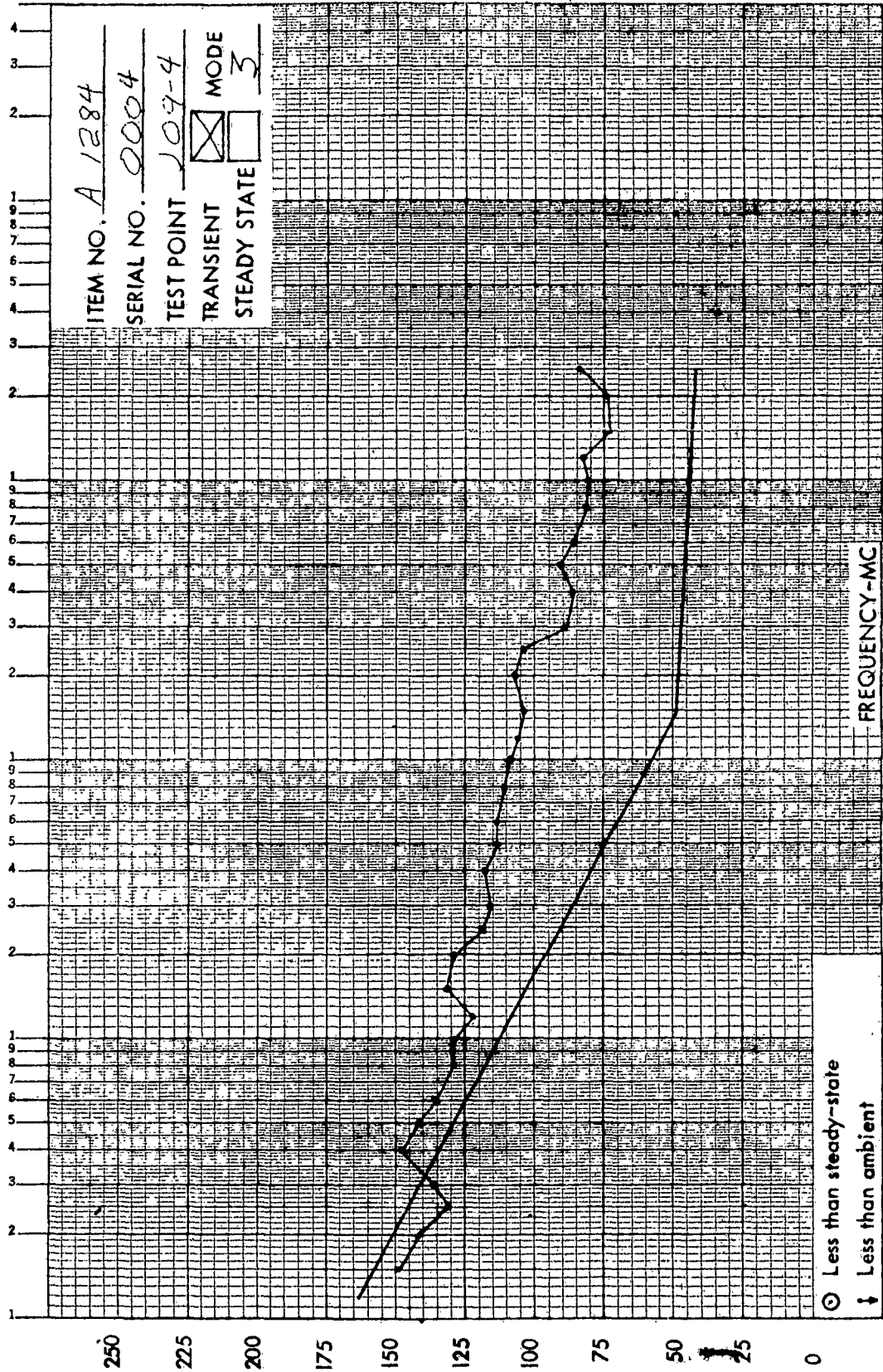
SEC.

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PAGE

35

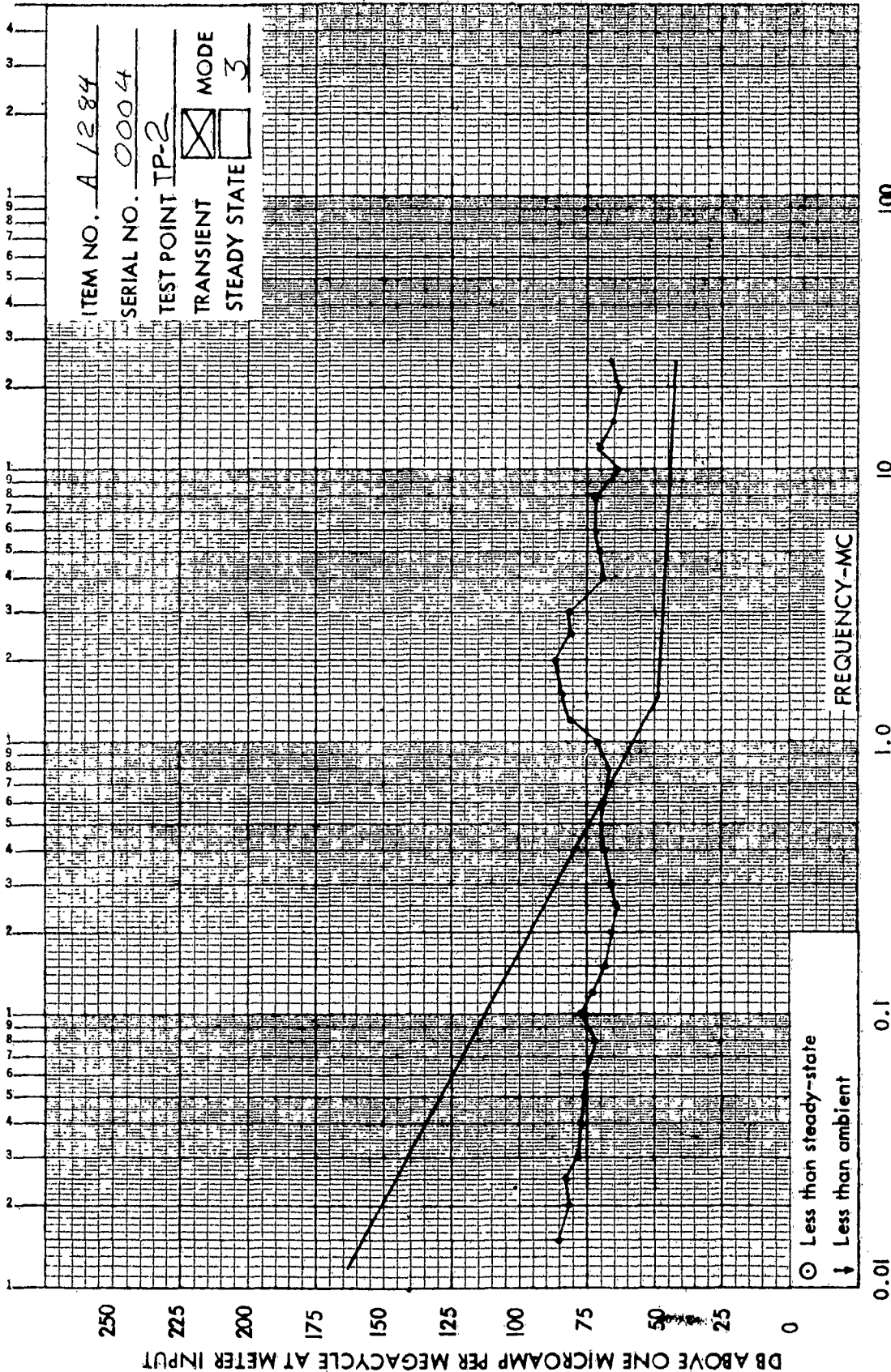
DB ABOVE ONE MICROAMP PER MEGACYCLE AT METER INPUT



BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

107-8

Data on page



BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

109, J10

Data on page

2-5493-0-5

APR 8 1963

BOEING

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SEC.

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2-5493-0-5

APR 6 1963

BOEING

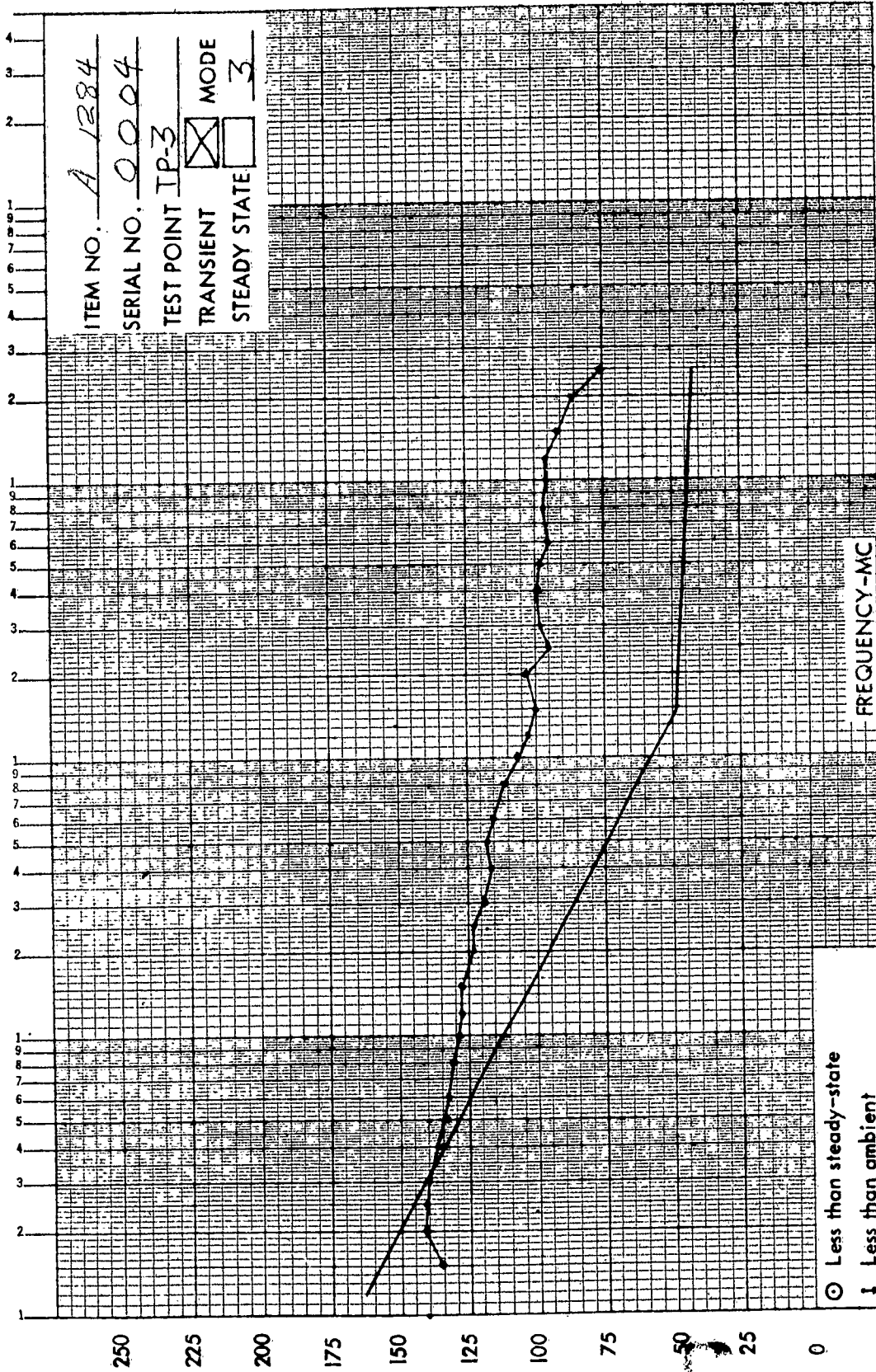
VOL.

SEC.

NO

PAGE

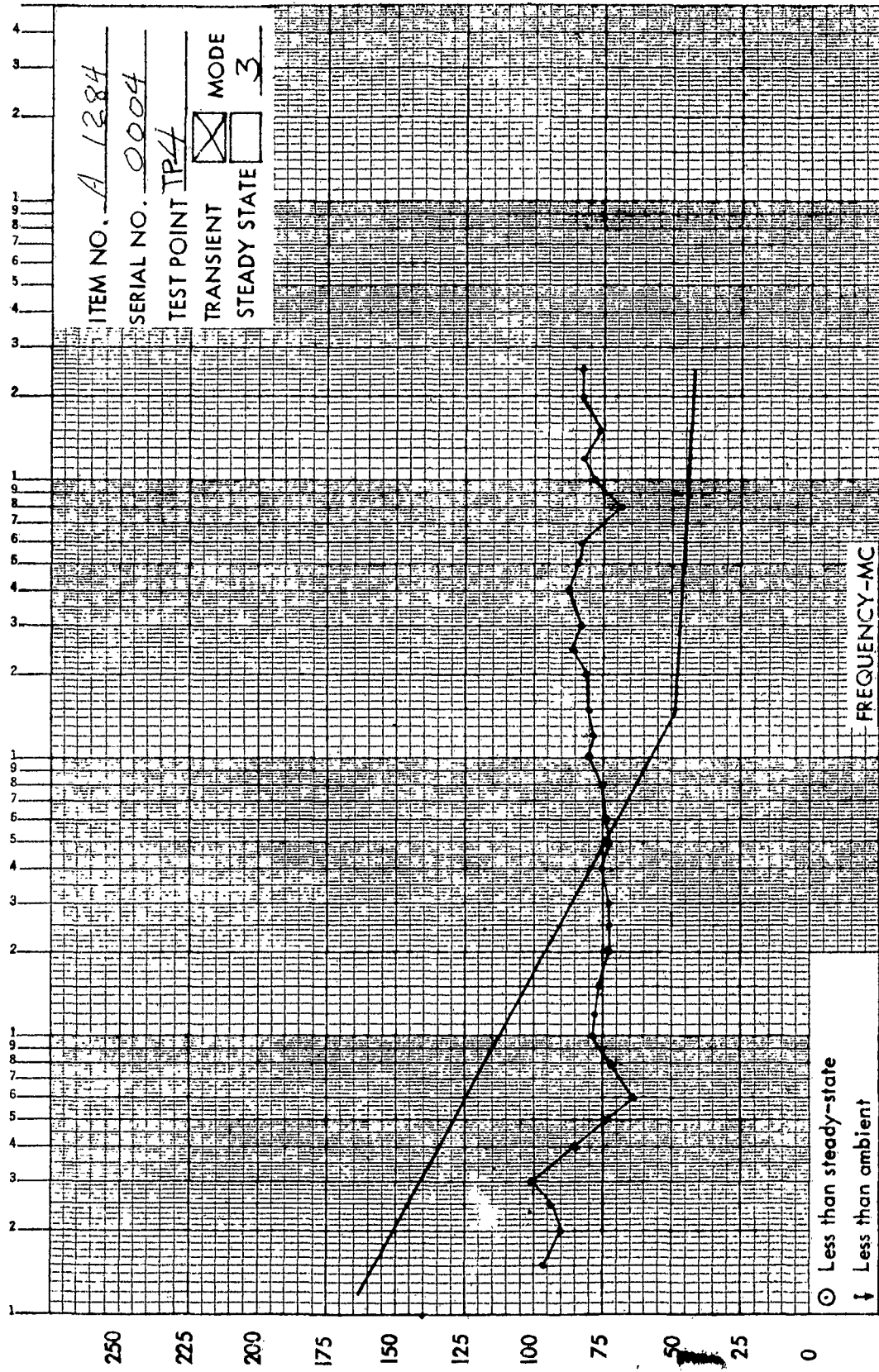
0847-21



ITEM NO. A 1284
 SERIAL NO. 0004
 TEST POINT TP-3
 TRANSIENT ☒ MODE ☐
 STEADY STATE ☐ 3

111-2
 Data on page

BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE



BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

113-4

Data on page

2-5493-0-5

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BOEING

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PAGE

2-5492-0-5

APR 8 1983

BOEING

VOL
SEC.

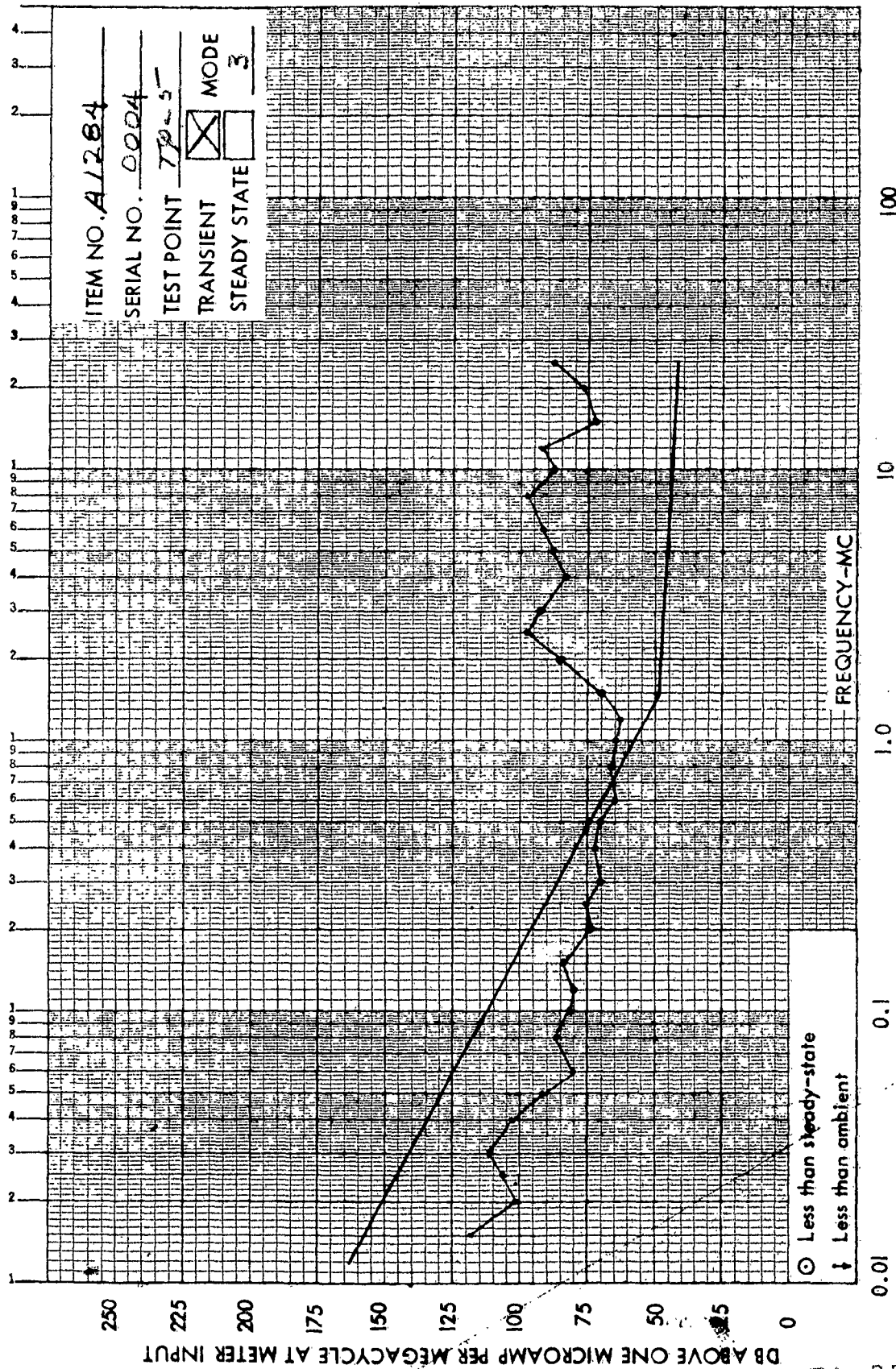
NO
PAGE

84

115-6

BROADBAND AND PULSED CW CONDUCTED DATA USING CURRENT PROBE

Data on page



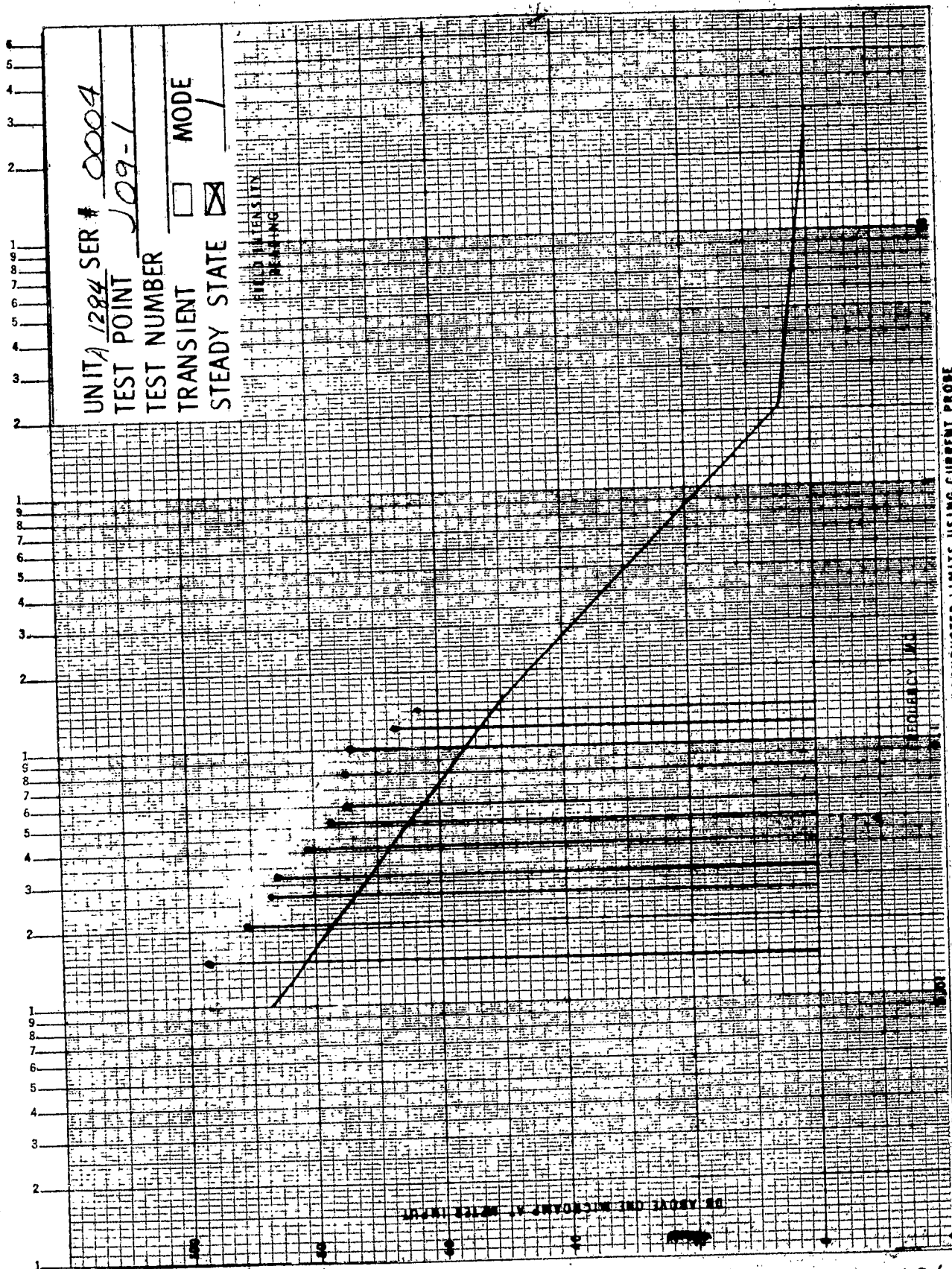


FIGURE 4 NARROWBAND CW CONDUCTED LIMITS USING CURRENT PROBE

SPECIFICATION

U3 4500 9225 ORIG. 1/51

APR 8 1963

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NO. T2-2786
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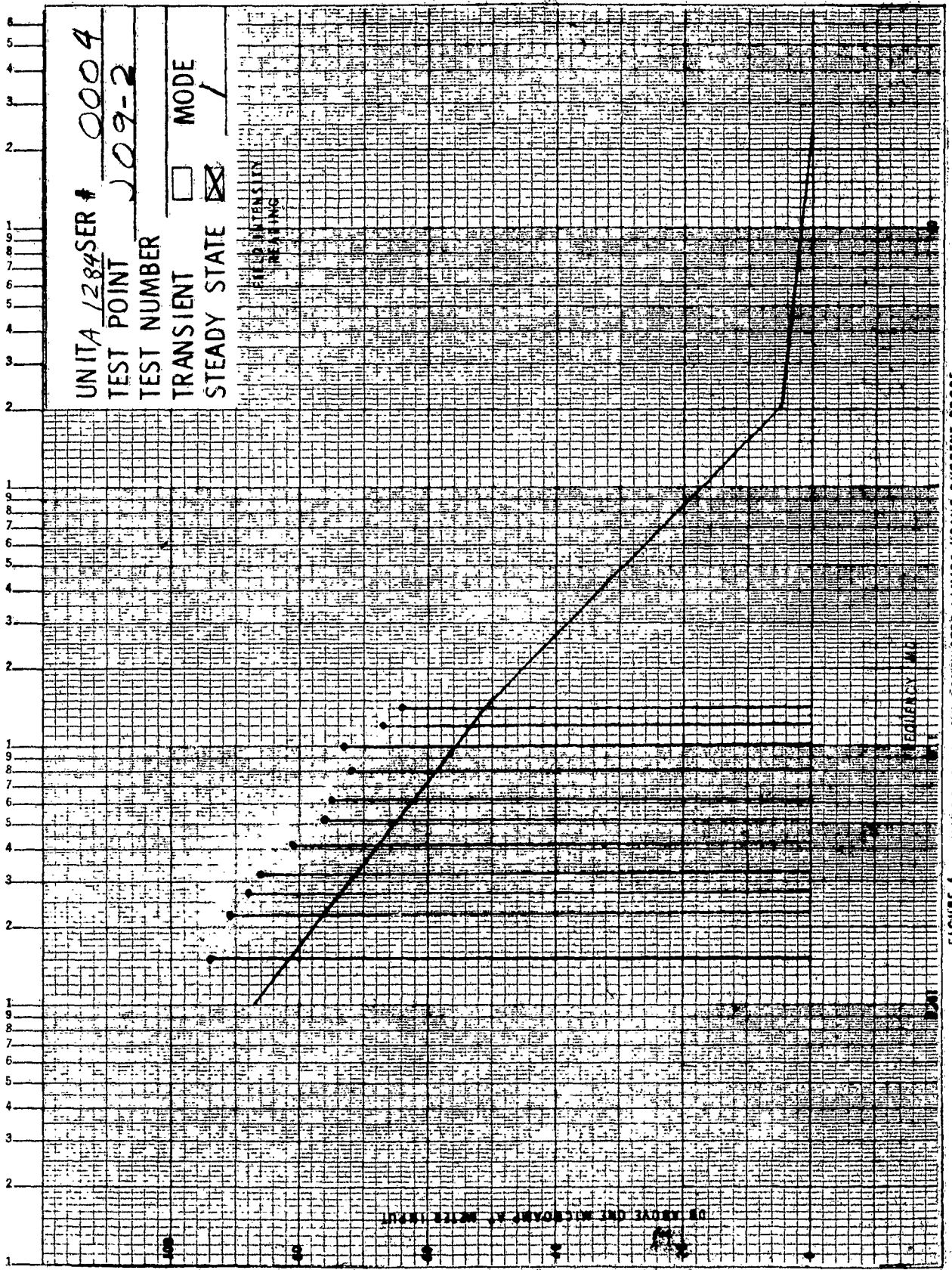


FIGURE 4 NARROWBAND CW CONDUCTED LIMITS USING CURRENT PROBE

SPECIFICATION

U3 4500 9225 ORIG. 1/61

APR 8 1963

BOEING

NO. T2-2786

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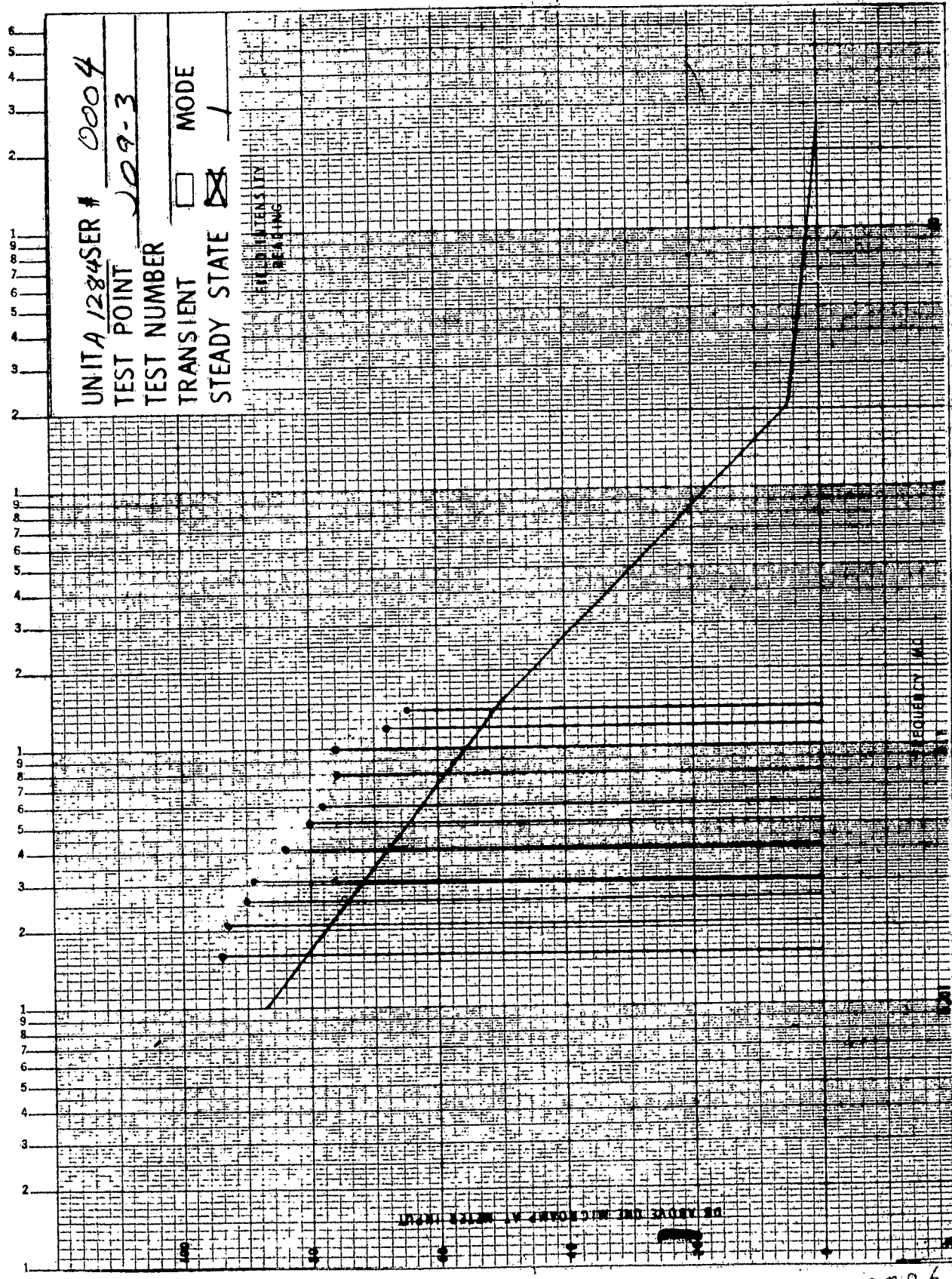


FIGURE 4 NARROWBAND CW CONDUCTED LIMITS USING CURRENT PROBE

SPECIFICATION

U3 4500 9225 ORIG. 1/61

APR 8 1983

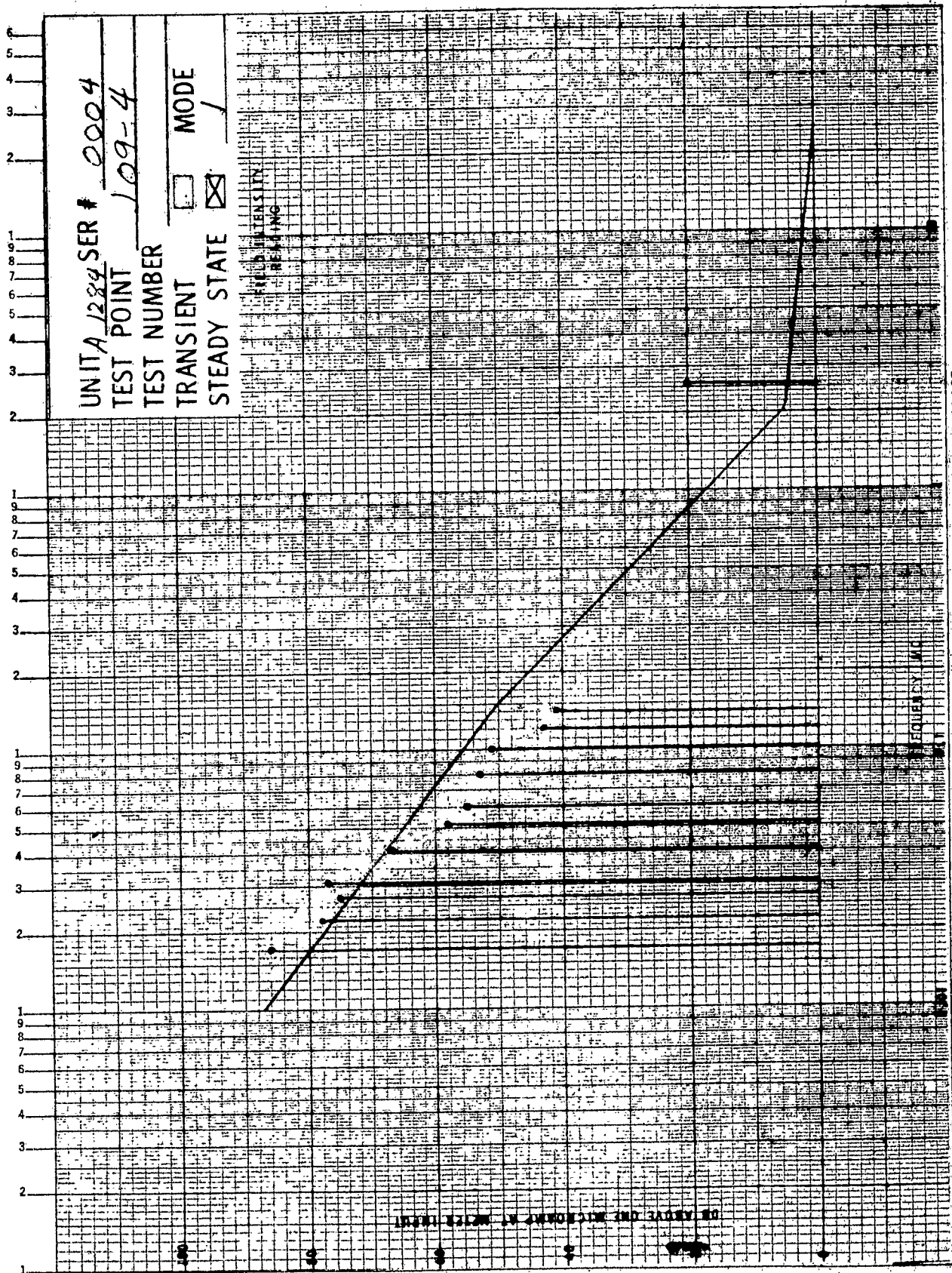


FIGURE 4 NARROWBAND CW CONDUCTED LIMITS USING CURRENT PROBE

SPECIFICATION

U3 4500 9225 ORIG. 1/61

APR 8 1963

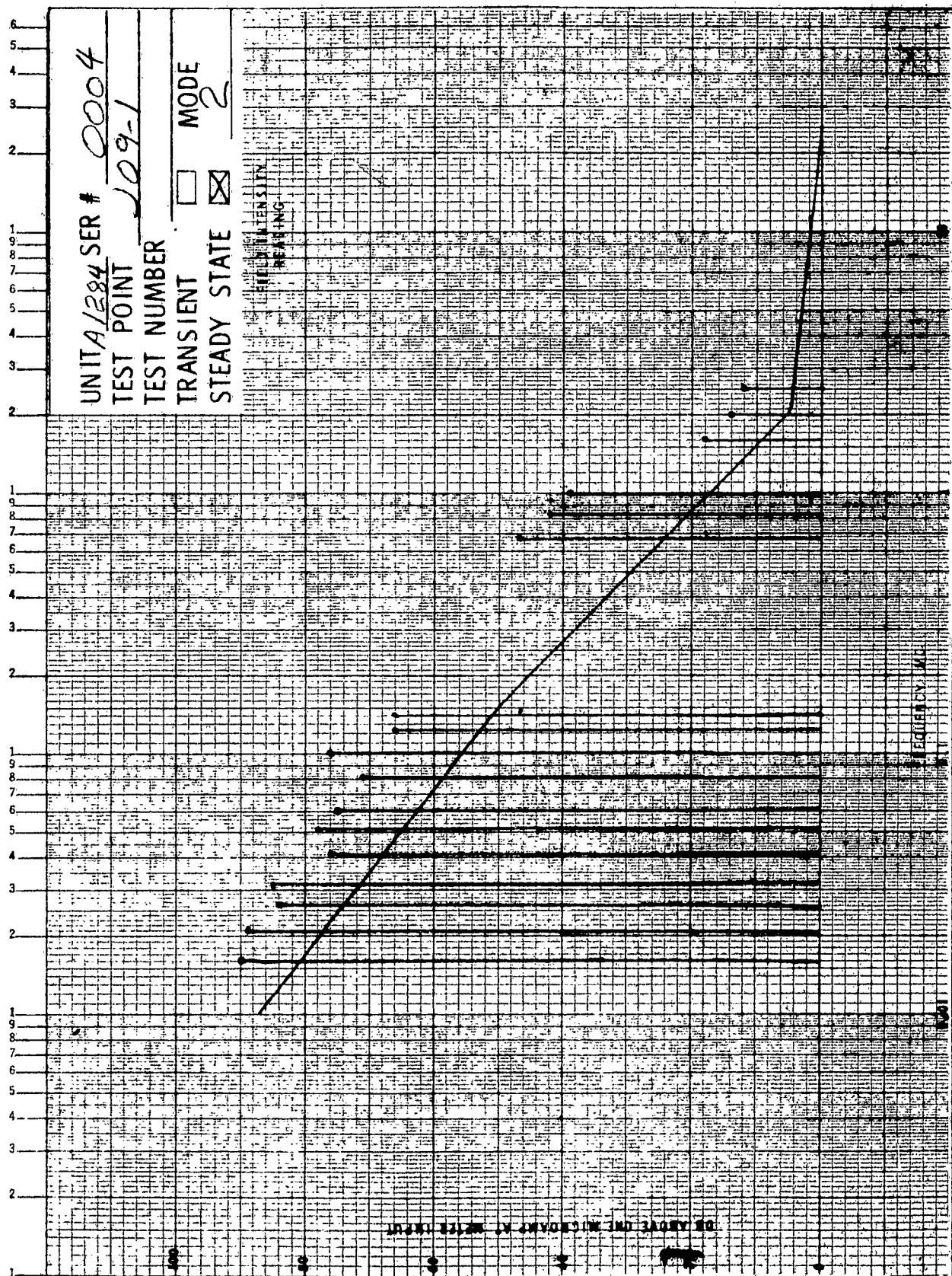
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SPECIFICATION

U3 4500 9225 ORIG. 1/61

APR 8 1957

BOEING

NO. 12-2786

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7

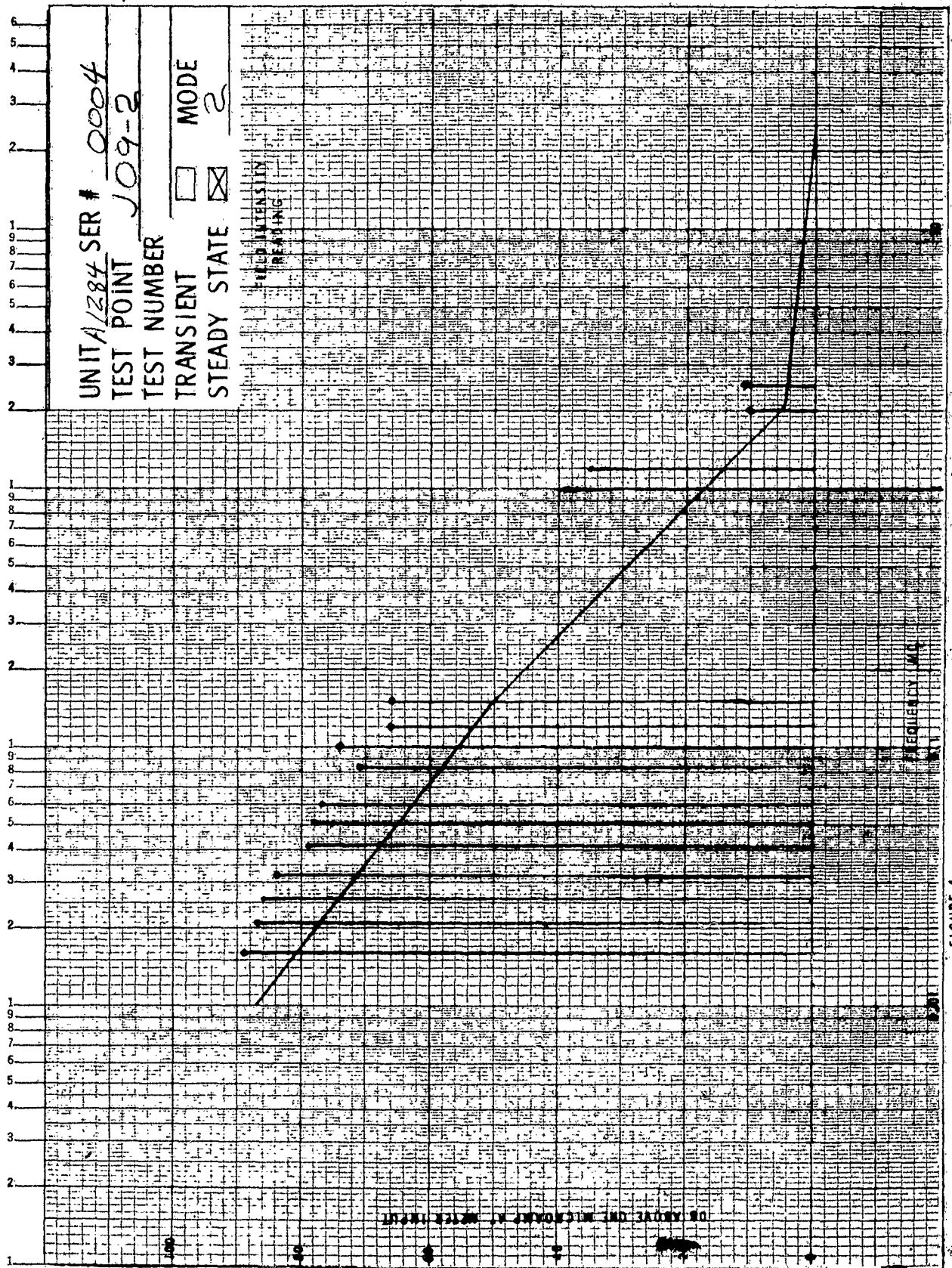


FIGURE 4 NARROWBAND CW CONDUCTED LIMITS USING CURRENT PROBE

SPECIFICATION

U3 4500 9225 ORIG, 1/61

APR 8 1963

UNIT 4, Sec III

BOEING

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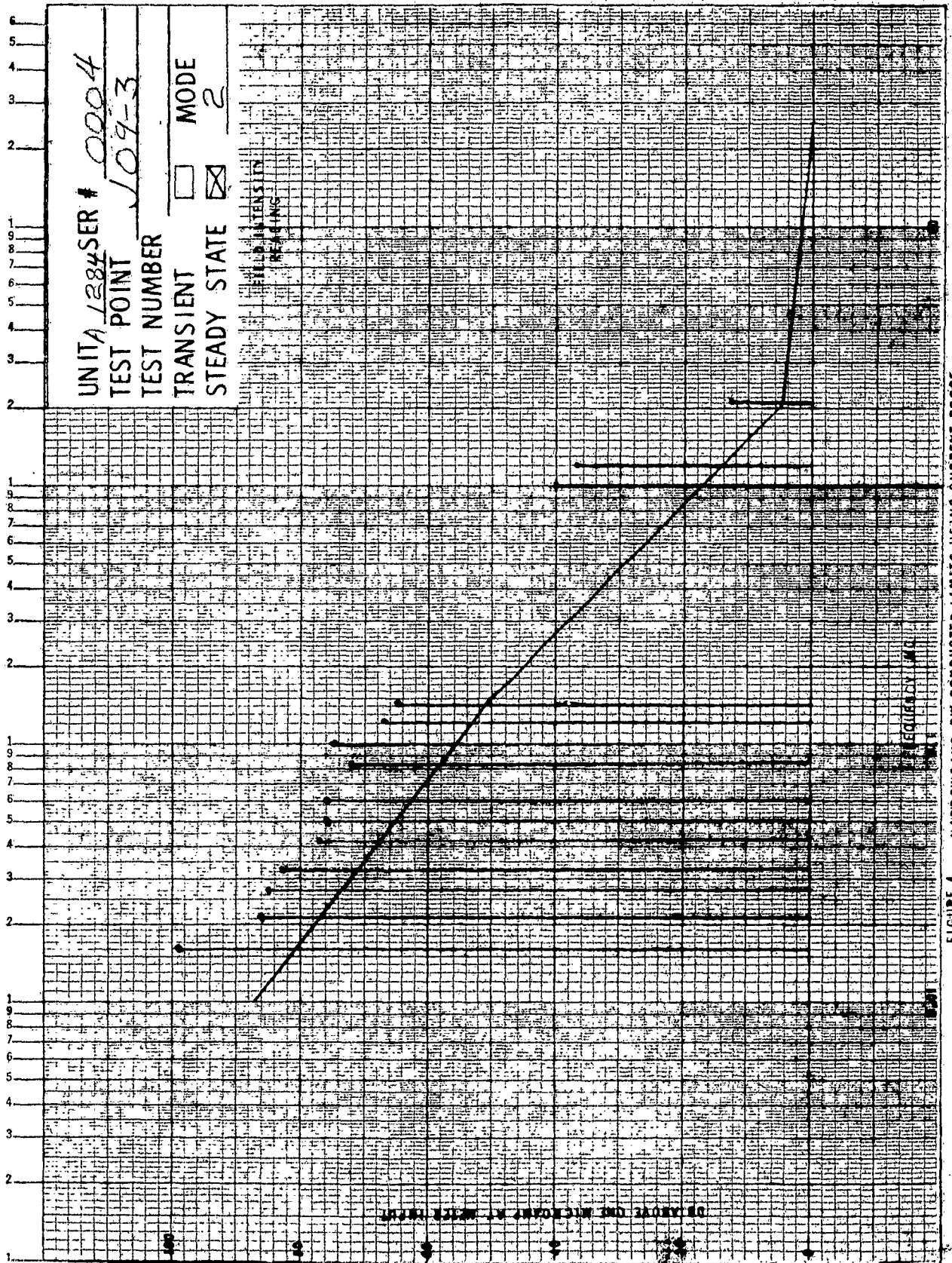


FIGURE 4 NARROWBAND CW CONDUCTED LIMITS USING CURRENT PROBE

SPECIFICATION

U3 4500 9225 ORIG. 1/61

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U.S. AIR FORCE, Dec 1961

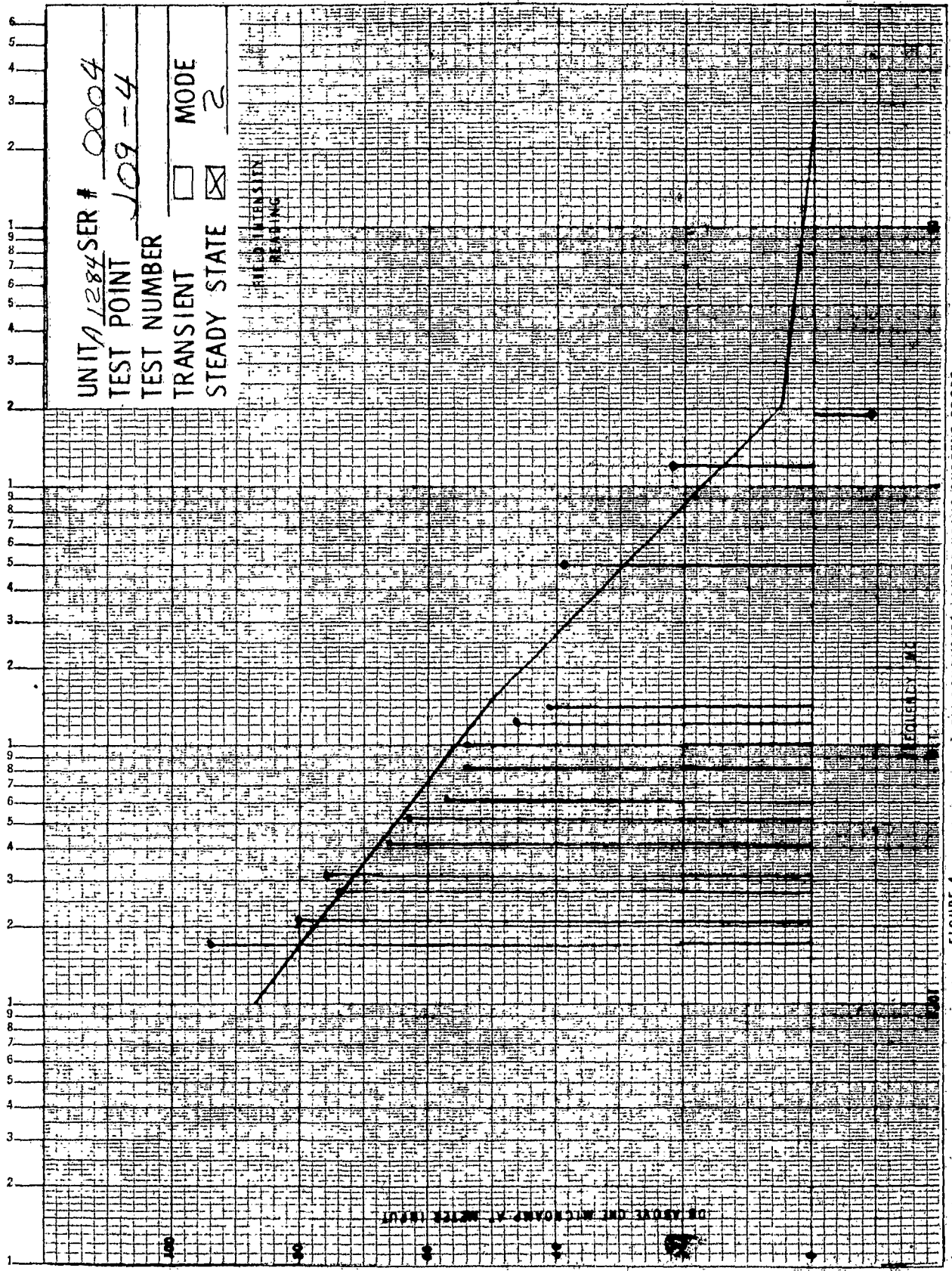


FIGURE 4 NARROWBAND CW CONDUCTED LIMITS USING CURRENT PROBE

SPECIFICATION

U3 4500 9225 ORIG. 1 61

APR 8 1963

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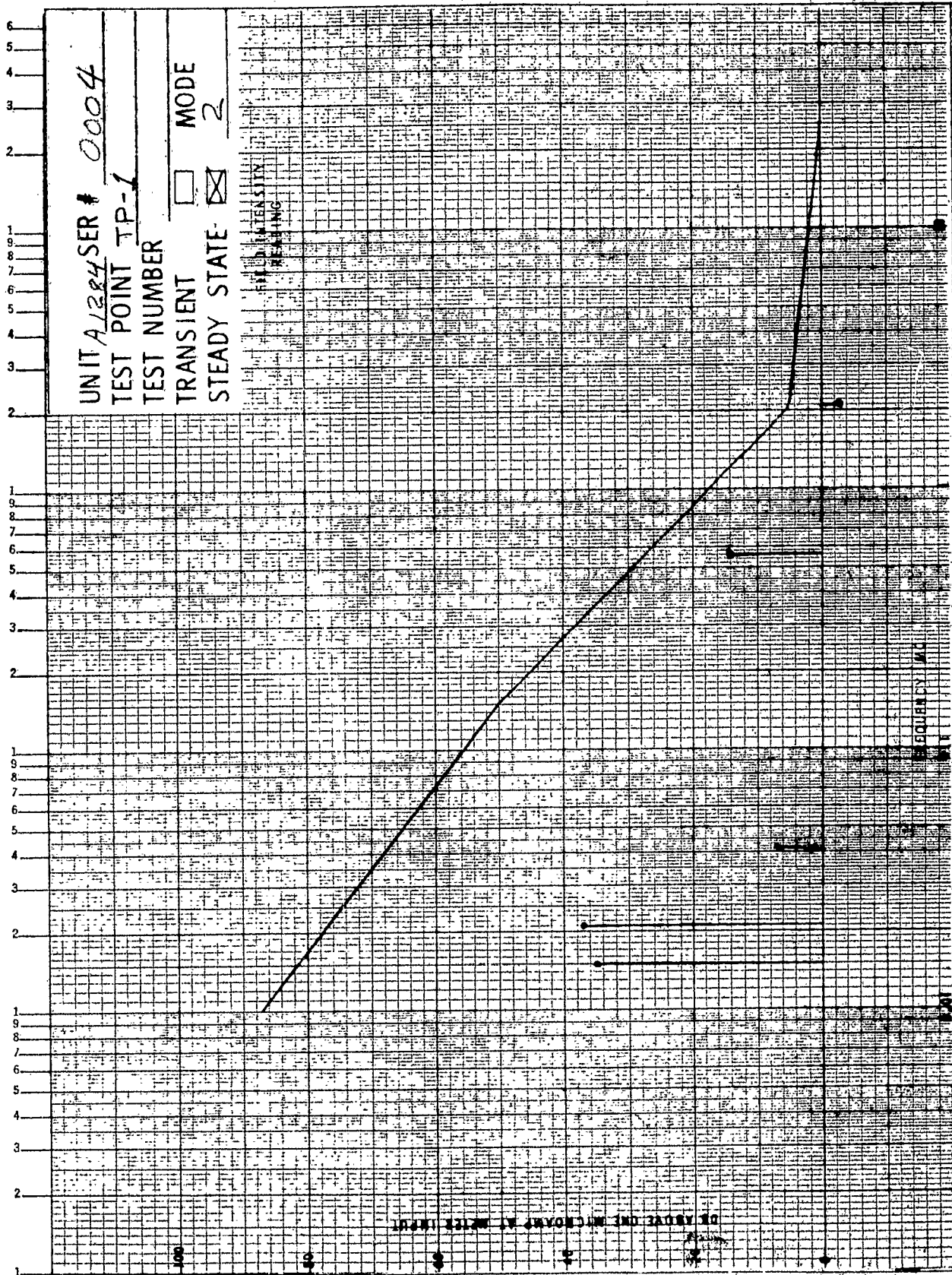


FIGURE 4 NARROWBAND CW CONDUCTED LIMITS USING CURRENT PROBE

SPECIFICATION _____

U3 4500 9225 ORIG. 1/61

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BOEING

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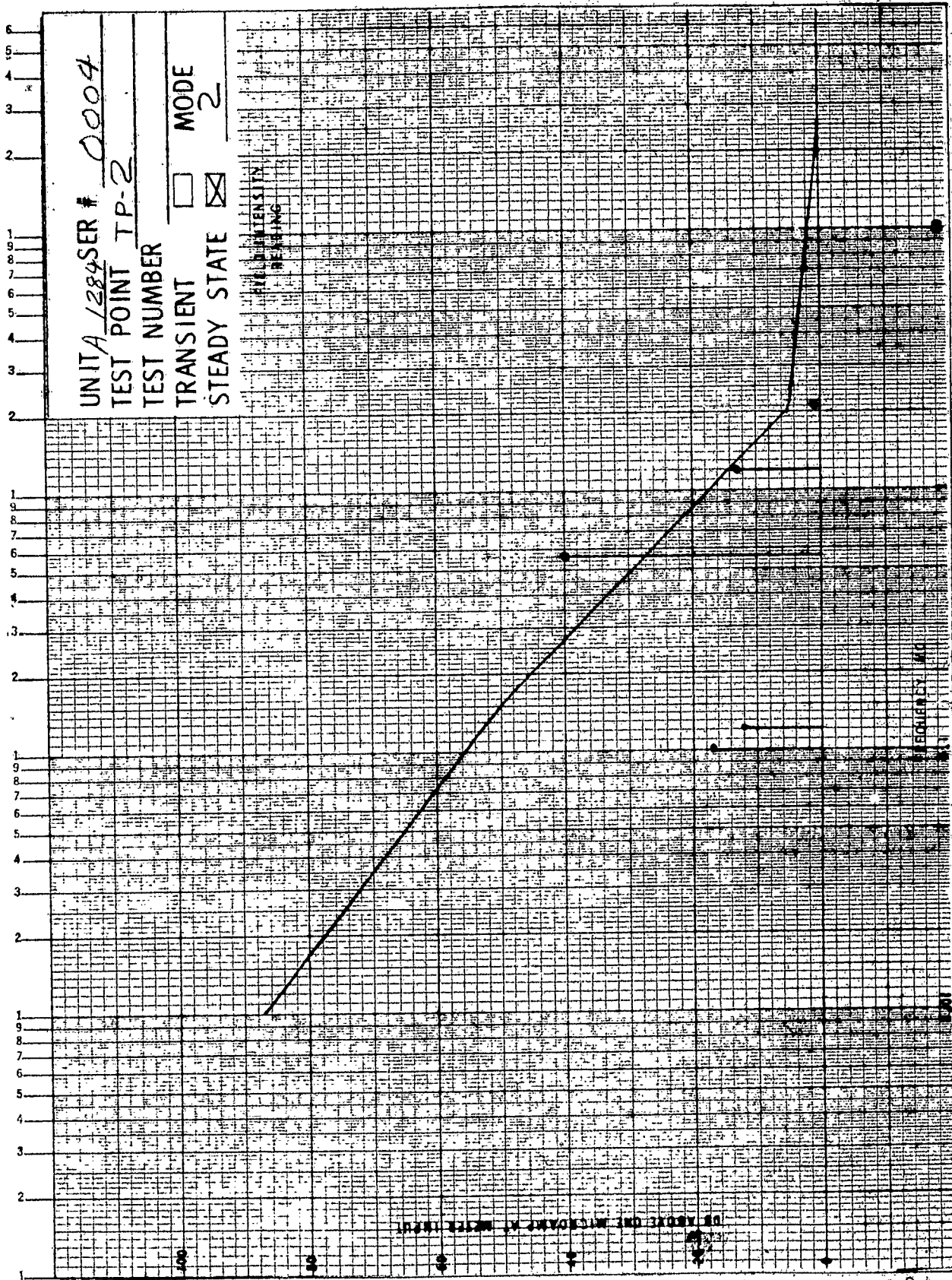


FIGURE 4 NARROWBAND CW CONDUCTED LIMITS USING CURRENT PROBE

SPECIFICATION _____

U3 4500 9225 ORIG. 1.61

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APPENDIX V

Tabulated Test Data

1.0 Radiated Interference

<u>Frequency</u>	<u>Mode</u>	<u>Test Point</u>	<u>Page</u>
15 KC - 400 MC	TH		67, 68
	AMB		69, 70
	1		71, 72
15 KC - 400 MC	2		73, 74
	3		75, 76

2.0 Conducted Interference

2.1 Broadband

30 cps - 15 KC	TH		77
15 KC - 150 KC	TH		78
.15 MC - 25 MC	TH		79
30 cps - 15 KC	1	J09-1	80
		J09-2	80
		J09-3	80
		J09-4	80
	1	J09-1	80
	2	J09-2	80
		J09-3	80
		J09-4	80
	2	TP-1	80
	3	TP-1	80
		J09-1	80
		J09-2	80
		J09-3	80
		J09-4	80
		TP-2	80
		TP-3	80
		TP-4	80
		TP-5	80
30 cps - 15 KC	3		
15 KC - 25 MC	1	J09-1	81, 82
		J09-2	83, 84
		J09-3	85, 86
	1	J09-4	87, 88
	2	J09-1	89, 90
		J09-2	91, 92
		J09-3	93, 94
		J09-4	95, 96
		TP-1	97, 98
		TP-2	99, 100
15 KC - 25 MC	2		

Added 4-8-63

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APPENDIX V (continued)

2.1 Broadband (continued)

<u>Frequency</u>	<u>Mode</u>	<u>Test Point</u>	<u>Page</u>
15 KC - 25 MC	3	J09-1	101, 102
		J09-2	103, 104
		J09-3	105, 106
		J09-4	107, 108
		TP-2	109, 110
		TP-3	111, 112
15 KC - 25 MC	3	TP-4	113, 114
		TP-5	115, 116

2.2 CH

<u>Frequency</u>	<u>Mode</u>	<u>Test Point</u>	<u>Page</u>
15 KC - 25 MC	1	J09-1	117
		J09-2	118
		J09-3	119
		J09-4	120
		J09-1	121
		J09-2	122
15 KC - 25 MC	2	J09-3	123
		J09-4	124
		TP-1	125
		TP-2	126

Added 4-8-63

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BROADBAND ☒ RADIATED ☒ STABILIZATION NETWORK ☐ TRANSIENT ☐ PEAK ☒
 NARROW-BAND ☐ CONDUCTED ☐ CURRENT PROBE ☐ STEADY STATE ☒ RMS ☐
 ITEM NO. 71284 SERIAL NO. 0004 TEST POINT _____ MODE TH

Freq. Kc	Meter Reading dB/μV/Mc	Probe Factor	Antenna Factor dB	Cable Loss	Corrected Level dB/μV/Mc	Spec. Limit	Remarks
15	36		49		85		
20	36		46		82		
25	34		44		78		
30	36		44		80		
40	35		40		75		
50	35		38		73		
60	36		36		72		
80	38		39		77		
100	38		36		74		
120	36		35		71		
150	36		33		69		
Mc							
.15	35		37		72		
.20	34		37		71		
.25	33		37		70		
.30	34		36		70		
.40	32		31		63		
.50	29		32		61		
.60	29		32		61		
.80	30		32		63		
1.0	32		29		61		
1.2	31		29		60		
1.5	30		29		59		
2.0	31		29		60		
2.5	30		23		53		
3.0	29		22		51		
4.0	31		23		54		
5.0	31		23		54		
6.0	32		20		52		

METER	IMPULSE GEN.	PROBE	OPERATORS	DATE
NF-105 $\frac{5}{8}$ N 1885	449		SANDEN	2-15-63
TX/NF-105 $\frac{5}{8}$ N 1571	1 NT.			
Plotted on page				30

BROADBAND ☒ RADIATED ☒ STABILIZATION NETWORK ☐ TRANSIENT ☐ PEAK ☒
NARROW-BAND ☐ CONDUCTED ☐ CURRENT PROBE ☐ STEADY STATE ☒ RMS ☐
ITEM NO. A 1284 SERIAL NO. 0004 TEST POINT _____ MODE TH

BROADBAND ☒ RADIATED ☒ STABILIZATION NETWORK ☒ TRANSIENT ☐ PEAK ☒
 NARROW-BAND ☐ CONDUCTED ☐ CURRENT PROBE ☐ STEADY STATE ☒ RMS ☐
 ITEM NO. 41254 SERIAL NO. 00041 TEST POINT 3 MODE AMB

Freq.	Meter Reading	Probe Factor	Antenna Factor	Cable Loss		Corrected Level	Spec. Limit	Remarks
Kc	dB/μV/Mc		dB			dB/μV/Mc	dB/μV/Mc	
15	36		49			85	97	TH
20	36		46			82	95	TH
25	34		44			78	93	TH
30	36		44			80	91	TH
40	35		40			78	89	TH
50	35		38			72	87	TH
60	36		36			72	85	TH
80	38		39			77	83	TH
100	38		36			74	81	TH
120	36		35			71	79	TH
150	36		33			69	77	TH
Mc								
115	35		37			72	77	TH
120	34		37			71	75	TH
125	33		37			70	74	TH
130	34		36			70	73	TH
140	32		31			63	71	TH
150	29		32			61	70	TH
160	29		32			61	70	TH
180	30		33			63	69	TH
1.0	32		29			61	69	TH
1.2	31		29			60	69	TH
1.5	30		29			59	69	TH
2.0	31		29			60	69	TH
2.5	30		23			53	68	TH
3.0	27		22			51	68	TH
4.0	31		23			54	68	TH
5.0	31		23			54	68	TH
10.0	32		20			52	67	TH

METER	IMPULSE GEN.	PROBE	OPERATORS	DATE
HP 100S N1385	IG 1155 N449		LINDER	2-22-63
TX 2N 1571	INTERNAL		DEWITT	
			Plotted on page 31	

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BROADBAND ☒ RADIATED ☒ STABILIZATION NETWORK ☒ TRANSIENT ☐ PEAK ☒
 NARROW- ☐ CONDUCTED ☐ CURRENT PROBE ☐ STEADY STATE ☒ RMS ☐
 BAND
 ITEM NO. 1284 SERIAL NO. 4004 TEST POINT 3 MODE 1

Freq.	Meter Reading	Probe Factor	Antenna Factor	Cable Loss	Corrected Level	Spec. Limit	Remarks
KC	dBμV/MC		dB		dBμV/MC	dBμV/MC	
15	36		44		58	97	AMB
20	40		46		66	95	
25	41		44		85	93	
30	47		44		91	91	
40	40		40		80	89	
50	35		38		73	87	AMB
60	32		36		72	85	AMB
80	30		34		77	83	AMB
100	38		32		74	81	AMB
120	36		35		71	79	AMB
150	36		32		69	77	AMB
MC							
15	35		37		72	77	AMB
20	34		37		71	75	AMB
25	33		37		70	74	AMB
30	34		36		70	73	AMB
40	32		31		63	71	AMB
50	29		32		61	70	AMB
60	29		32		61	70	AMB
80	30		33		63	69	AMB
100	33		29		62	69	
120	31		29		60	69	AMB
150	30		29		59	69	AMB
200	32		29		61	69	
250	30		23		53	68	AMB
300	31		22		53	68	
400	31		23		54	68	AMB
500	31		23		54	68	AMB
600	32		20		52	67	

METER		IMPULSE GEN.	PROBE	OPERATORS	DATE
NE105 S/N 1885		TG 115 S/N 449		HEWITT	4-26-63
TX S/N 1571		INTERNAL		INDEX	
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 NARROW-BAND ☐ CONDUCTED ☐ CURRENT PROBE ☐ STEADY STATE ☒ RMS ☐
 ITEM NO. 1284 SERIAL NO. 0004 TEST POINT 3 MODE

Freq. KC	Meter Reading dB/μV/MC	Probe Factor	Antenna Factor dB	Cable Loss	Corrected Level dB/μV/MC	Spec. Limit dB/μV/MC	Remarks
15	47		49		96	97	
20	41		46		87	95	
25	41		44		85	93	
30	45		44		91	91	
40	40		40		80	89	
50	37		36		73	87	
60	36		36		72	85	AMB
80	38		34		71	83	AMB
100	38		36		74	81	AMB
120	36		35		71	79	AMB
150	36		33		69	77	AMB
MC							
.15	35		37		72	77	AMB
.20	34		37		71	75	AMB
.25	33		37		70	74	AMB
.30	34		36		70	73	AMB
.40	32		31		63	71	AMB
.50	29		32		61	70	AMB
.60	29		32		61	70	AMB
.80	35		33		68	69	
1.0	32		29		61	69	AMB
1.2	31		29		60	69	AMB
1.5	32		29		61	69	
2.0	32		29		61	69	
2.5	30		23		53	68	AMB
3.0	31		22		53	68	
4.0	31		23		54	68	AMB
5.0	31		23		54	68	AMB
6.0	32		20		52	67	AMB

METER	IMPULSE GEN.	PROBE	OPERATORS	DATE
NE105 SN 1885	EG115 SN 447		H. E. W. 117	2-26-63
TX SN 1571	INTERNAL			
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BROADBAND ☒ RADIATED ☒ STABILIZATION NETWORK ☒ TRANSIENT ☒ PEAK ☒
 NARROW-BAND ☐ CONDUCTED ☐ CURRENT PROBE ☐ STEADY STATE ☐ RMS ☐
 ITEM NO. 1284 SERIAL NO. 0004 TEST POINT 3 MODE 3

Freq. KC	Meter Reading dB/μV/MC	Probe Factor	Antenna Factor dB	Cable Loss	Corrected Level dB/μV/MC	Spec. Limit dB/μV/MC	Remarks
15	47		49		96	97	OFF
20	47		46		93	95	ON
25	48		44		92	93	ON
30	51		44		95	91	ON
40	48		40		88	89	ON
50	52		38		90	87	ON
60	45		36		81	85	ON
80	40		39		79	83	ON
100	38		36		74	81	ON
120	36		35		71	79	ON
150	40		33		73	77	ON
MC							
15	38		37		75	77	ON
20	39		37		76	75	ON
25	38		37		75	74	ON
30	42		36		78	73	ON
40	45		31		76	71	ON
50	55		32		87	70	ON
60	61		32		93	70	ON
80	63		33		96	69	ON
100	60		29		89	69	ON
120	52		29		81	69	ON
150	49		29		78	69	ON
200	48		29		77	69	ON
250	58		23		81	68	ON
300	69		22		91	68	ON
400	63		23		86	68	ON
500	61		23		84	68	ON
600	57		20		77	67	ON
METER			IMPULSE GEN.		PROBE	OPERATORS	DATE
NF105 SN 1885			IC115 SN 449			HEWITT	2-26-63
TX SN 1571			INTERNAL				
Plotted on page							34

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BROADBAND & PULSED CW CONDUCTED DATA USING CURRENT PROBE

30 CPS to 15 KC

PEAK



RMS



ITEM NO. A 1284

SERIAL NO. 0004

[illegible]

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BROADBAND & PULSED CW CONDUCTED DATA USING CURRENT PROBE

30 CPS to 15 KC

PEAK ☒

RMS

ITEM NO. A 1284

SERIAL NO. 0004

[illegible]

Type: Transient (T), Steady-State (S), Ambient (A), Threshold (TH)

METER	PROBE	OPERATORS	DATE
NIM 40A S/N 310-4	345-25	HEWITT	2-3-63
		Plotted on graph 36	

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U.S. District Court
Southern District of New York

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[illegible]

[illegible]

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APPENDIX VI

Abbreviations, Symbols and Definitions

E-I	Electro-Interference
V/A	Vertical Antenna
D/A	Dipole Antenna
TH	Threshold (Meter noise background plus transducer factor)
AMB	Ambient
SS	Steady-State
CW	Continuous Wave
TP	Test Point
SN	Serial Number
DB	Decibel
DB/ μ V	Decibels above one microvolt
DB/ μ V/MC	Decibels above one microvolt per megacycle bandwidth
DB/ μ A/MC	Decibels above one microampere per megacycle bandwidth
DB/ μ A/20 KC	Decibels above one microampere per 20 kilocycles bandwidth

Added 4-8-63

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APPENDIX VII

M&IR Paperwork (Quality Control Approval)

Added 4-8-63

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[illegible]

PART NUMBER		SERIAL NUMBER		UNIT NO. (MFG. SER. DATE)		TEST EQUIPMENT INDEX		PAGE 3	
5-22552-36		0004		1000		M & IR		00	
5-22552-36		0004		1000		M & IR		00	
5-22552-36		0004		1000		M & IR		00	
MM 50517	2-8-3	HAFFERBERT	WILLIAMS	1000	1000	1000	1000	1000	1000
BAC 513819	NF-105	NOISE & F.I. METER	1885	22 APR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC X 90847	IG-115	UHF IMPULSE GEN	449	9 APR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC X 098077	91550-1	RF CURRENT PROBE	277-90	14 MAY 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC 520945	TX/NF105	TUNING UNIT	1571	15 MAR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC 199456	NM104	FIELD INTENSITY METER	310-4	15 MAR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC 91550-1	STANDARD	CURRENT PROBE	345-25	10 APR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC 199022	TEKTRONIX	OSCILLOSCOPE	5455A	10 APR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC 190270	TEKTRONIX	PLUG-IN UNIT	CA 012400	10 MAY 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC 512826	606A	SIGNAL GENERATOR MP	038-01883	10 MAY 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
PFC 6310	803	DC-AC VOLTMETER FLUX	2557	26 MAR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC 167815	612A	HEWLETT PACKARD	1332	22 APR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC 153357	608C	H LEVEL SIG GEN	15552	11 APR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC 198755	481	DIGITAL UNIT	11.2729	14 MAR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC 109437	50-w-2	Non-Linear Amplifier	3615	6-17-63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC X 105085	---	30 A SHUNT	---	12 APR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
BAC 103375	205AG	HP Audio Sig Gen	---	16 MAY 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63
---	1744	AC Ammeter	---	14 APR 63	2-25-63	2-25-63	2-25-63	2-25-63	2-25-63

(C.C.) AIR FORCE VERIFICATION

DATE

JOB NUMBER		TASK NUMBER		PART NUMBER		NOMENCLATURE		POWER SUPPLY GROUP	
51268		25-22552-36		25-22552-36		POWER SUPPLY GROUP		LF (FIG A 1284)	

PART NUMBER 2-3639	SERIAL NUMBER 0004	MFG. UNIT NO. U3 4284 5004	NFG. PLAN DATE 2-8-53	ORIG. PLAN DATE 2-8-53	QC APPROVAL <i>[Signature]</i>	PLNG. APPROVAL <i>[Signature]</i>	REVISION BY <i>[Signature]</i>	MANUFACTURING & TESTING PROCESS	INSP. SERIAL NO.	SHIP STAMP	OPERATION ACCEPTANCE INSP. DATA
EXP. REF. NO. 50517	ORIG. PLAN DATE 2-8-53	LABOR STD. SET-UP RUN.	FACTORY WORK CENTER TOOL	OPEN SOURCE NUMBER	10	20	30	40	50	60	
<p>INSPECTION VERIFY THAT TEST SAMPLE HAS PASSED P/T PRIOR TO START OF E-I TEST.</p> <p>SETUP FOR TEST PER DOCUMENT D2-11802.</p> <p>DRAWN TEST EQUIPMENT & LOO ON PAGE 3.</p> <p>PERFORM E-I TEST COMPLETE PER D2-9801 & D2-11802; RECORDED DATA.</p> <p>RECORD TOTAL RUNNING TIME <u>53.4</u> ENTER TEST REPORT NUMBER <u>T2-2786-3</u></p> <p>TEST COMPLETE <u>C. Tracy</u> ENGINEER DATE <u>3-4-63</u></p> <p>INSPECTION VERIFY COMPLETION OF OPERATIONS 20 THRU 50.</p> <p>ROUTE COMPLETED ORDER TO M & ES FOR.</p> <p>REPRODUCE & ROUTE ORDER.</p>											
<p>DISPATCH</p> <p>2-3970</p>											
JOB NUMBER 51268	PART NUMBER 25-22552-36	NOMENCLATURE POWER SUPPLY GROUP LF (FIG A 1284)		LEAD INSP. STAMP	INSP. REC. DATE	CURT					

INCR. IN SPEC.		PART NUMBER		SERIAL NUMBER		BOEING		INTEGRATED RECORD SYSTEM		PAGE 1/1	
25-28997		25-28997		0001		PLANNED EVENT (1st P.)					
WORK ORDER	ACC. SERIAL NO.	START SCHED.	COMP. SCHED.	DATE	PLANNED BY	Q.C. APPROVAL					
78105	57735	074	087	2-8-53	HOFFERT						
P.A. DATE	DATE OF APPROVAL	ITEM NUMBER	MODEL	PROCESS NUMBER							
7/4/53	7/4/53	E1040(289)	WS133A	096031							
PART NUMBER		NOMENCLATURE		DRAWING USED ON ASSY. NO.		INST. LOC.		P/T DATE		Q.C. STAMP	
OPER. SEQUENCE NUMBER		FACTORY WORK CODE/TOOL		LABOR STD. SET-UP		RUN		ER/SUPPL. SERIAL NO.		SHOP STAMP	
010								1020433			
020											
030											
PCA 1013											
2-3970											
PCZ											
NO DRAWINGS REQUIRED		DRAWING OR DOCUMENT NO.		ARCH-REC-ORD		SHEET NO.		CHANGE NO.		EFFECTIVITY	
51279		E4-20		25-28997		TEST SET-E1-P45		SET 1/4			
NO DRAWINGS REQUIRED		DRAWING OR DOCUMENT NO.		ARCH-REC-ORD		SHEET NO.		CHANGE NO.		EFFECTIVITY	
51279		E4-20		25-28997		TEST SET-E1-P45		SET 1/4			

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2/3639
074/087

PCA 1013
2-3970

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REL. III

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